Behavior Analysis
PSY221
Laboratory Manual

Spring Semester 2020, Version 9.0

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General Course Description

Why PSY220 and PSY221 are Required Courses

There are two extremely important aspects to this course. Both are absolutely critical to your success in the field of Psychology. Unfortunately, neither is very well established in common knowledge. As a result, you may not have grown up always knowing them. This is very unlike your common knowledge in the other sciences. **Getting the core idea of modern psychology will probably require that you change your opinion about what psychology is all about.** This makes psychology more difficult than biology or physics because in Biology and Physics you already know and accept the basic rules of the "game."

The aspects that you take for granted in the other sciences include:
   a. the clear and unshakeable realization that all discussions must be based on proven facts rather than opinions, and
   b. the fact that you already have the correct basic understanding of the actual fundamental machinery of Physics and Biology (such as the knowledge that planets orbit the sun, and that germs rather than witchcraft cause disease).

So that you can gain the necessary intuitions to better understand the basic core ideas of the courses in the Psychology program, the Psychology Department provides an introduction to Behavior Analysis early in your career where it will do you the most good in simplifying your progress on your career path.

First, you will learn in this course that modern Psychology is and must be a science.

Everything you believe about Psychology must be a proven fact or you are obligated to discard it. The practice of Psychology is not a matter of personal opinion nor simply believing something that some authority told you. Modern psychology is focused exclusively on what has been objectively proven to work. Just as a judge or juror must believe only proven facts about a defendant, a modern psychologist must believe only proven facts about why someone does something.

Approaches to psychology based on opinion have gone out of favor in the last few decades as the field of Psychology came to understand that Psychology's only real hope of actually helping people was to be a science like medicine rather than the opinion of an authority figure as is the case in a cult. Psychology's

methodology is now no different than Biology, Chemistry, or Physics. This means that:

a. Psychology deals exclusively with things that can be objectively measured (e.g., everyone can "see" it for themselves

b. Psychology deals exclusively with things that have been proven to be true (e.g., the rules of evidence must be valid)

Science is not at all like having to say that a piece of art is good art simply because an authority like a professor or someone on television tells you that it's good art. Psychology as a science has objective facts like "gravity." If you release a brick, it will fall to the ground because nature actually works that way, not just because an authority tells you it should fall. You can go home and wait until no one is looking and release a brick of your own choosing to see what happens. In fact, someone who never even saw another human being could discover gravity for themselves. It is the reliance on facts that anyone can prove for themselves that makes something a science and science has the best track record in helping humankind. Medicine separated from witchcraft when it became a science.

Because the success you have in your career depends upon your selling behavior change programs that actually work, you would be wise to gather up skills that actually work. This means you have the right and obligation to scientifically prove for yourself what is true. This course will allow you to prove for yourself the basic processes underlying all psychological phenomena in an actual living organism. Your pigeon is real. It is not a computer program designed to prove the professor's opinion true. As a result, you can safely believe that the results you obtain with your pigeon are actually true, and worthy of you building your career upon them.

Second, you will learn that every behavior of every living organism is caused by the relationships between behaviors and/or events to which that particular organism or its ancestors had been exposed.

a. The frequency of an operant is controlled by the consequences of that behavior. We learned to put money in the vending machine because good things came out when we did, and we stop putting money into it when it stops producing good things.

b. A reflex response will come to occur to a signal of the elicitor of that behavior. Our hearts race and we break out into a sweat when we hear or see an otherwise innocuous stimulus that signaled a scary event in our past.

This course gives you the opportunity to discover what really works in psychology and to practice those procedures. Your patient's quality of life depends upon you knowing what really works because they, by definition, were unable to

arrange things for themselves so that they got what they wanted. For example, they may claim that they want to lose weight but just can't make it happen. Your quality of life depends upon your knowing how things actually work because your income will entirely depend on your ability to fix people's problems that they themselves cannot fix. If their problem is so simple to fix that even an idiot can fix it, then they themselves (or someone else) could have fixed it and they would not need to pay you to fix it for them.

What Do You Actually Do in This Course?

This course gives you a chance to study the adaptation of behavior or "learning" in a living organism. Living organisms learn as the result of specific experiences.

The specific steps that you will carry out in this course will expose a subject to a series of events as specified in the lab projects detailed in this lab manual. **You will work on each project for several days controlling what your pigeon experiences and observe what your pigeon does as the result of those experiences.** You will then write up short lab reports describing the effect of those procedures so that you can think through the relationship between what the pigeon experienced and the resulting behavior of that pigeon. In this way, you will come to know how behavior actually works, and will therefore be able to fix it when something goes wrong with your or someone else's behavior.

Course Staging / Style of this Manual

This course has evolved over several years. It is very highly engineered. Anything that was found to be difficult for students in the past is now preceded by graded steps, which first establish the required skills. The only downside is that the manual may appear a bit foreboding before you read it because it is long. The advantage of a very detailed and long instruction manual, such as this one, is that **you will not have to do anything that is beyond your skill. You will always be given very clear instructions of exactly what you need to do.** At each step you will have already learned the requisite skills you need. This makes the course more productive in addition to making it easier and more enjoyable. However, the engineering has not resulted in magic that makes the wisdom pop into your head even it you don't really try. The engineering has made it so that **if you read the instructions, think about what is required, and sincerely try by carefully reading the manual, and diligently attending to the behavior of your pigeon; then you will easily succeed and earn an A**. Our analysis of the most recent student outcomes indicates that virtually every single low grade can be attributed to either not reading the manual, failing to attend all the labs, or turning work in late (or not at all). Please read the manual carefully, please come to all the lab classes, and please pay close attention to the behavor of your pigeon and please turn your work in on time. Our intent and our hope are for you to earn an A in this course.

Read each lab before you start and you will know exactly what to do. No set of instructions can be all things to all people. We all differ. We have all sat through a lecture where we already knew everything that was said and were bored to tears, while some fellow students were totally overwhelmed. We have also sat through lectures where we didn't understand a word and everyone else followed every point. This manual tries to explain every detail so that no one is left behind. The inevitable result is that some students will be bored because the manual drones on about things that they already know perfectly well. Please realize three things: 1) it is easier for some people to have to read something that they already understand than for someone to have to do something that they don't understand yet. 2) If you skip over some section because you think you know what it says, you may be wrong about something and that may cost you points. To repeat, if you read everything and try, you will easily succeed. 3) An inevitable problem that arises when trying to write a manual for everyone is that some people need to be told what to do while others need to be told what not to do. As you can guess, the approach of this manual is to say both. Don't allow yourself to be put off by being told something that does not apply to you such as "you cannot leave a lab report in the hallway and consider it turned in" because a past student had done exactly that and couldn't understand why they didn't get credit for a paper that disappeared (or at least they believed such a preposterous story would get them off the hook). Keep in mind the intent of this manual is to try to enable someone who needs that instruction to be successful in this course. After all, the point of

this manual is to give every student the material necessary to get an A in this course, and to be successful in their career.

Quizzes / Exercises

There will be 8 quizzes and 2 exercises over the material covered. Each is worth 25 points. The total points for quizzes and exercises is therefore 250 points.

The first three quizzes are given early in the semester and cover the general knowledge you will need to know to be successful in this course. Quizzes 4-8 are based on the experimental procedures. Pre-experiment quizzes will be given before you start each experiment. There are two exercises: one on understanding some very simple math you will be using and one on how to submit material to the Canvas plagiarism (Turnitin) site.

Note that you must put your student ID number on them rather than your name. Memorize your student ID number.

Time Lines

You must turn in your lab reports on or before their due dates. Since the amount of time required will depend on your understanding of the principles of behavior, you may spend more or less time on the experiments than other people in the lab. You can compare your progress working with your pigeon's behavior: 1) with the announcement made each day by the lab assistant, or 2) by asking a lab assistant, or 3) on the computer monitor on the wall above the instructor's desk.

If you are falling behind, or if you would like to get through the assignments quickly so that you can do an experiment of your own, or if you would simply like to finish this class early, or if you would like to earn extra points, you may work on your labs up to five days a week rather than only two days a week. **The more days per week you run your pigeon, the easier this course will be, the sooner you will finish, the more you will enjoy it, and the more likely you will get an A in this course.** The lab facility is available for out-of-class work Monday through Friday 8:00 am to 4:30 pm – whenever it is not being used for another lab. You are most strongly encouraged to work with your pigeon as often as possible. It will make the assignments in this class very easy and will allow you to express your creativity with your own experiment at the end of the semester. Additionally, you will get extra credit.

If you are having trouble, first re-read the instructions in this manual from start to finish, then try to catch up by working with your pigeon every day. Consult the lab assistant at any point and they will help you.

If you fall too far behind in magazine training, or shaping your pigeon to key peck, it will be done for you so that you will not necessarily fail the course, but you will lose points. Be sure to finish these tasks before the deadline cutoff date. Come in extra days before the deadline if you feel you may miss the deadline.

Your Subject

You will be assigned a lab partner. You and your partner will then be assigned a living subject so that you can observe the actual behavior of that actual subject. A pigeon is used in Psychology (rather than a guinea pig) because pigeons are inexpensive, easy to care for, easy to monitor, and they don't bite!
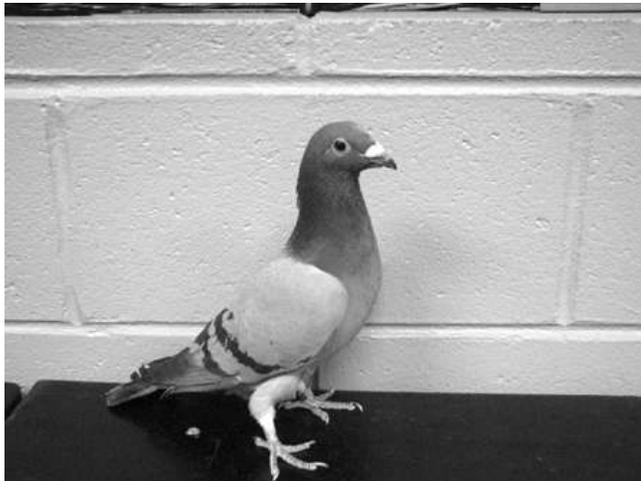
Background Information

The pigeon you will be assigned has been raised in captivity by a local breeder and will be returned to the breeder at the end of the semester. The birds are all healthy, so there is little likelihood of catching a disease from them. However, as is the case whenever you interact with any animal including your own pet, it is a good idea to always wash your hands after handling the bird.

Birds will have a leg band with a number on it that can be used for identification. But to be on the safe side, carefully note the pattern of coloration of your bird so that you can identify it if the leg band comes off. Male and female pigeons look alike so there is no easy way to determine the sex of the bird.

Interacting With Your Pigeon

During the semester you will be responsible for taking care of your assigned pigeon. Caring for the pigeon is simple and pretty much common sense. Basically it's giving it some food and water every day. The following information is to help you effectively care for your pigeon

Limits Imposed by Living Organisms

You are assured of making progress each day you work with your pigeon, but you can only go so far each day. The pigeon learns each time it eats the food you give it for doing a particular behavior. At some point however, it becomes satiated and will not eat anything more that day. After that you cannot teach it anything for the rest of that day.

As you provide more food presentations during a lab session, you will notice the bird eats more slowly. This will probably begin after about 20-50 eating episodes, depending on the size of your bird. It's most productive to terminate the session when the bird begins to satiate, because, at that point, food is no longer functioning as a meaningful reinforcer and you will accomplish little or nothing. For example, consider how hard you would work on an overtime job at a factory if all you got for it was to eat for free before you left at 9:00 pm if you had just finished stuffing yourself at the company's free Thanksgiving dinner at 6:00 pm.

Keep in mind that establishing the criterion behavior in your subject takes many days; it is totally impossible to do it in a few cram sessions just before the lab is due. Acquiring learned behavior is like building muscles, learning a musical skill, losing weight, journeying to a distant goal, and saving money. Each of these processes take time and cannot be accomplished all at once.

We have all waited until the last minute to do some task and then put out a supreme effort to get the job done. While that strategy sometimes works, an "all-nighter" is impossible with the lab projects in this course. The pigeon can eat only so much in a 24-hour period, and therefore can only learn so much in a 24-hour period. Even though under ideal conditions, grass will grow six inches in two weeks, there is nothing you can do no matter what to get it to grow six inches in one day because you put off planting it until the day before the test.

Handling

Unlike dogs (but like many cats), pigeons do not enjoy being handled. But, they can be tamed somewhat, and will learn to tolerate being handled. It is best

to handle the birds carefully but firmly. The pigeon cannot hurt you by biting or pecking (they have no teeth and their beak is not sharp), so don't be alarmed by any attempted pecks. The pigeon may flap you with its wing. While this makes a loud and sudden slapping noise that may startle you, it is substantially less forceful than you clapping your hands while applauding. Occasionally, the pigeon may accidentally scratch you with its toenails, but this only occurs when it is not being held properly, and you have probably done more skin damage to yourself by scratching a mosquito bite.

To pick up the pigeon, open the cage door just enough to place one hand in and gently pin the bird against one of the walls of the cage. Then open the door completely and grasp the bird with both hands. Always hold the bird so that it faces you with its wings in the palms of your hands; your fingers should be under the pigeon with your thumbs on its back. The bird may be more comfortable if you allow it to grasp your fingers with its feet. Do not squeeze the bird, but hold it securely enough to keep its wings pinned down.

How to Hold Your Pigeon

When getting the bird out of the cage, it may flap around in the cage; the solution is to just get your hand on the bird and pin it down until you can reach in with the other hand to get the bird out.

Review:
1. Open the cage door just enough to reach your hand in.
2. Do not be alarmed by the pigeon flapping its wings or trying to peck you.
3. Gently, but firmly, pin the pigeon against the floor or back wall.
4. Reach in with your other hand and securely grab the pigeon.

Weighing Procedure

You will be placing your bird in a plastic container to restrain it during weighing.

In order to weigh the bird and not the container, first place the empty container on the scale and "zero the scale" by pressing the "ON" button again. The term for this is "taring the scale."

After taring the scale, remove the container and slide the bird into the empty container headfirst and place the container back onto the scale. Caution: Do not leave your bird in the weighing container any longer than necessary and place your hand above the pigeon in case it starts to get out of the pitcher.

Note that you must also record each daily weight with date, time, and your initials on the Weight Sheet that will be kept in a clipboard in the pigeon room.

You must indicate on your Data Sheet that you zeroed the scale (tare it) with the empty container on the scale.

THE SCALE MUST READ ZERO <u>WITH THE EMPTY CONTAINER ON IT</u> SO THAT THE WEIGHT FOR THE BIRD DOES NOT INCLUDE THE WEIGHT OF THE CONTAINER.

Review:
1. Turn scale on by pressing the ON button.
2. Place container on the scale and press the ON button again.
3. Remove container and place bird in container.
4. Place container and bird on scale.
5. Write down weight on clipboard.
6. Write down the weight, date, and time on your Data Sheet. Indicate that you did tare the scale. If you forgot to tare the scale, then the bird weight will be wrong. If you forgot, go back to Step 2 again.
7. Remove container and remove bird.
8. Replace container on scale.

Weighing Scale

General Custody Procedures

1. Identification card. When you are assigned a bird, you must fill out an identification card to place on the front of the cage. (See sample card on page 33.) Use a pen with permanent ink – do not use a pen with water base ink. Be sure your card is present on the cage throughout the semester, otherwise your pigeon will be fed by the animal caretaker and it will become overweight.

2. Cleaning. You are responsible for cleaning the food and water containers. You do not need to change the papers beneath the cage; the caretaker will routinely change them.

3. Sickness. Normally, pigeons are free of disease and adapt well to the living conditions in the lab. Occasionally, however, one of the birds could become sick. Typically, the animal caretaker will detect the problem and take care of it, but you may be the first to notice. The first sign of sickness is failure to eat and the consequent steady loss of weight. Unusually wet and excessive droppings are also warning signs of sickness. Report any of these symptoms to your lab assistant immediately. The bird will be given medicine and you will be able to continue using your pigeon.

4. Pigeon Care. You and your partner are expected to weigh your bird 5 days a week and provide it with the food and water it needs.

5. You must read and comply with the preceding APA ethical guidelines for the use of animals.

You are Responsible for the Welfare of Your Pigeon

Even though it is extremely easy to feed and water a pigeon, there have been occasional semesters where someone did not take care of their pigeon. In order to totally eliminate this problem altogether, there will be spot checks to assess how well you care for your subject. A portion of your final grade is based on your custody of your pigeon. This includes clean water, correct weight, and daily weight records. Work out any arrangements you wish with your lab partner. Keep in mind, however, that **regardless of whose fault it is, you both will lose points if your pigeon is not cared for properly.** If your partner is negligent, inform the lab assistant immediately. You will not be penalized for the negligent

behavior of your partner once you inform the lab assistant that your partner is not fulfilling their pigeon care obligation.

Note: Video surveillance equipment is installed and you may be videotaped at any time while you are in the lab and animal room. You can be assigned a lower final grade or even fail the course based on video records.

1. **DO NOT ABUSE YOUR OR ANY OTHER PIGEON**
2. **FEED AND WATER YOUR PIGEON PROPERLY**
3. **DO NOT FEED OR WATER OR REMOVE FEED OR WATER FROM ANYONE ELSE'S PIGEON.**

MISTREATMENT OR NEGLIGENCE IN CARING FOR THE PIGEON ASSIGNED TO YOU OR HARMING ANY OTHER STUDENT'S PIGEON OR EXPERIMENT WILL RESULT IN YOUR EXPULSION FROM THE COURSE AND/OR A COURSE GRADE OF F.

NO EXCEPTIONS!

American Psychological Association Ethical Principles for Use of Animals in Research

1. The acquisition, care, use, and disposal of all animals are in compliance with current federal, state or provincial, and local laws and regulations.

2. A psychologist trained in research methods and experienced in the care of laboratory animals closely supervises all procedures involving animals and is responsible for ensuring appropriate consideration of their comfort, health, and humane treatment.

3. Psychologists ensured that all individuals using animals under their supervision have received explicit instruction in experimental methods and in the care, maintenance, and handling of the species being used.

4. Psychologists made every effort to minimize discomfort, illness, and pain of animals. A procedure subjecting animals to pain, stress, or privation is used only when an alternative procedure is unavailable and the goal is justified by its prospective scientific, educational, or applied value.

5. When it is appropriate that the animal's life be terminated, it is done rapidly and painlessly.

From the Guidelines for Student Research:

> The basic daily needs of each animal shall be of prime concern. Students *must* ensure the proper housing, food, water, exercise, cleanliness, and gentle handling of their animals. Special arrangements have been made for care during weekends, holiday, and vacations. Students must protect their animals from sources of disturbance or harm including teasing by other students.

Feeding, Watering, and Deprivation

Pigeons in the wild eat seeds and grains, but in the lab they will be fed a processed food that is pelletized and nutritionally balanced. Cages have two containers on the front. Food is placed in one container and clean, fresh, water is kept in the other container. Make sure that the food container is on the side of the cage that is away from the bird in the adjacent cage. Otherwise, the adjacent

bird may eat the food you give to your bird and your bird will not be the correct weight the next day. You will need to wash out the water cup with a paper towel to remove residue each time you refill it. There must be <u>at least one inch of water</u> or the pigeon cannot drink, since it must dip its entire beak into the water. If you have the cup full to the very top, it will spill and get you wet when you open the door**. Always keep the water cup 3/4 full. Do not under fill or over fill the water cup.**

When the pigeon has had free access to food for some time in its lab environment, it is at its normal free feeding, or *ad libitum (ad lib)* lab weight. The lab assistant has maintained the birds on free feeding; has determined their 100% lab weight, and has reduced each pigeon to its 80% running weight. This is the approximate weight pigeons maintain in the wild. The motivation level established by 80% weight is about equivalent to you before your evening meal after having had lunch, when you're hungry but not faint-headed from hunger.

You and your lab partner will need to arrange to weigh, feed, and assure that your bird has clean water <u>daily</u> (Monday through Friday). You do not need to weigh your bird on Saturdays, Sundays, or during holidays. The animal caretaker will attend to the feeding and watering on those days. Note that any failure to properly care for the bird will result in both you and your partner losing points, and in the extreme, could result in you both being assigned a failing grade.
The goal is to maintain your bird as close to its 80% weight as possible. How much you feed your bird depends on its percentage body weight and whether you are going to run it the next day or not.

You are expected to come in every day and weigh and handle your bird regardless of its weight. Additionally, you are responsible for making sure that your bird's weight stays within its running range so that you can run your bird the proper amount at least every lab day.

See examples below of how to do feeding on run days and on non-run days.

Run Days

On days you run your bird, weigh the pigeon.

If the bird's weight is over 85% of its ad lib weight, run it for only 1 or 2 reinforcers and do not post feed it. If your bird is often over its 80% weight when you try to run it, feed it less than the difference between its 80% weight and its current weight on the next no-run day, or if you ran it but did not post feed it last run day, run it for fewer reinforcers. If you ran it and post fed it, post feed it half as much as you did last run day.

If your bird is often under its 80% weight on run days, feed it more than the difference between its 80% weight and its current weight on the next no-run day, or run it for more reinforcers, or post feed it if you run it every day.

Keep in mind that if you give your bird too many food presentations or feed it too much one day, then it will be overweight the next day. The next day it can

weigh more than when you weighed it after the session plus the weight of the food you gave it because it will drink water, and the water adds to its weight.

Non Run Days

On days that you do not run your bird, weigh the pigeon. If the bird's weight is over its 85% weight, do not feed it. If the weight is under the 85% weight, feed it enough to bring it up to the 80% weight. A general rule is provided in the following table.

> \> 85% - no food
> 84-85% - 1 scoop
> 82-83% - 1 ½ scoops
> 79-81% - 2 scoops
> 77-78% - 2 ½ scoops
> 75-76% - 3 scoops
> \< 75% - 3 scoops and contact lab assistant
>   or Dr. Palya

If the bird is losing weight on that regime, feed it a bit more. If the bird is gaining weight on that regime, feed it a bit less.

Incorrectly feeding your pigeon or failure to feed your pigeon will result in points being deducted due to your failure to follow the instructions correctly. The weight sheets are checked daily. These penalty points add up very quickly. Before you know it, you could lose a letter grade!

Birds Weighing Less Than 75%

If your bird is below 75%, feed your bird immediately and give the bird 3/4 full cup of fresh water, and do NOT allow the bird to drop to that weight again! See the lab assistant immediately and report that your bird was below its 75% weight. **Failure to report that your pigeon is less than 75% of its weight is considered mistreating your pigeon. You may be assigned an F for the semester if you fail to report that your bird is below its 75% weight.**

Note that the animal caretaker weighs a selection of birds each weekend, and you and your partner will lose points from your final grade if either of you fail to maintain accurate records of your bird's weight for any reason.

Sample Pigeon Cage Identification Card

_____

Band Number

_____

221 / 504 Lab Section

_____

Student ID Number

_____

Student ID Number

No Run Weight (85%) _____
  (too heavy to run)

80% Weight _____

Critical Weight (75%) _____
  (dangerously underweight)

_____

Free Feeding Weight (100%)

Sample Filled-in Pigeon Cage Identification Card

Apparatus

The apparatus provides you with a testing chamber, a real-time recorder, and a Computer Controller. The computer will make training your bird and keeping track of your progress very simple. Its operation is intuitive while at the same time providing you with both diverse and sophisticated control programs.

The pigeon chamber is 32 cm wide, 31 cm deep, and 35 cm high. The food aperture is 13 cm above the floor and is 5 cm square. The 2.5 cm diameter response key is 26 cm above the floor.

The graduate chamber is 31 cm wide, 32 cm deep, and 38 cm high. The 2 cm diameter left response key is 29 cm above the floor.

Pigeon Chamber
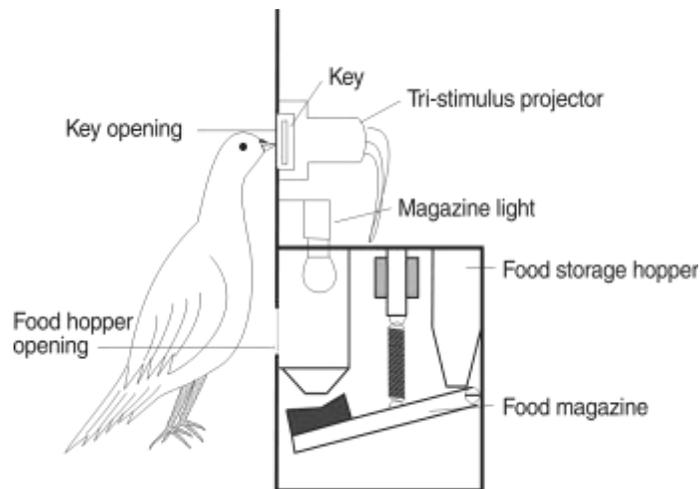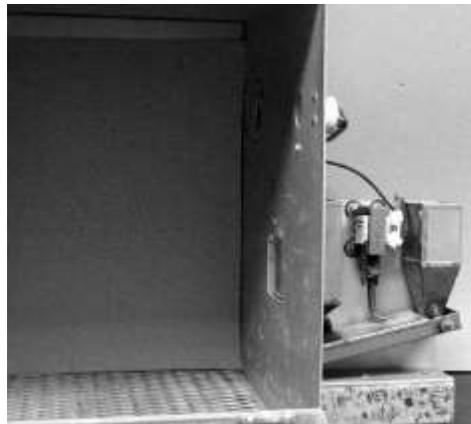
You will notice two things when you look into the pigeon chamber.

1. Near the top to one side is a small circular hole with a piece of plastic mounted behind it. This is a response sensor, labeled a "**key**." The key has a switch attached to it so that a peck or movement of the key can be recorded electrically (The word's origin goes back to telegraph keys which were buttons that activated electricity, e.g., typewriter key.) Behind the panel, locate the flat plastic key with a white cylindrical **stimulus projector** behind it. The projector allows either of two colors (red or green) to be projected onto the key.

2. Near the bottom in the center of the chamber is a large hole that is the **food aperture**. This is the opening through which the pigeon can eat food.

The **food magazine** is a container of food from which the pigeon eats. It is located behind the panel. The food magazine is a hinged tray filled with food that can be raised with an electromagnetic solenoid so that the pigeon can reach it through the small hole in the bottom of the food aperture. There is also a **magazine light** that comes on when the food tray is raised. Extra food is stored in the rear food hopper. Keep this hopper filled with food.

Control Computer

The portions of the pigeon chamber that interact with the pigeon are controlled by the Control Computer.

Refer to the following picture and text for equipment operating instructions. If the equipment fails to operate as indicated, see your lab assistant immediately. *Do not, under any circumstances, attempt to repair the equipment yourself!* This equipment is safe if used as directed, but it may produce a dangerous shock to you if you attempt to make repairs yourself.

Buttons and Indicators

Schedule Select Button

Each time this button is momentarily pressed, the computer steps to the next available preprogrammed schedule so you can select the schedule you want.

Start Button

Momentarily pressing this button starts the program.

Stop/Clear Button

Momentarily pressing this button the first time stops the program and presents the session data on the display.

Momentarily pressing the **Stop/Clear** button a second time (wait about 5 seconds) clears the data and gets the computer ready to start.

Do not inadvertently press the Stop/Clear button twice at the end of the experiment. If you do, you will clear your data from the computer, and you will be unable to get credit for that lab day.

Note that if no reinforcers are delivered, the computer cannot calculate any summary statistics based on the number of reinforcers and the display will appear as if it had been cleared.

Schedule Light (one each for Schedule 1 and Schedule 2)

The left and right red schedule light indicates which Schedule is in effect when you are doing an experiment with two different procedures. The left light indicates that Schedule 1 is in effect and the lower left two buttons are active. The right light indicates that Schedule 2 is in effect and the lower right two buttons are active.

Reinforcement Mode (S* Mode) Button (one each for Schedule 1 and Schedule 2)

Momentarily pressing this button determines which reinforcement mode is in effect, that is to say, what happens when you press the **S* Activate** button located below this mode button. When the little green light is on, the

apparatus is in the manual or immediate reinforcement mode. When the little green light is off, the apparatus is in the automatic or **S* Activate** mode (see below).

Reinforcement Activate (S* Activate) Button (one each for Schedule 1 and Schedule 2)

In "Manual / Immediate" Mode (green light on)

Momentarily pressing the **S* Activate** button in this mode immediately and unconditionally operates the reinforcement magazine.

In "Automatic / S* Activate" Mode" (green light off)

Momentarily pressing the **S* Activate** button in this mode causes the next peck on the key to result in the food magazine operating. The green light will flash when the key is waiting to reinforce the next peck (or is "armed"). Note that this function is "one shot." To arm the key again, you must press this button again.

Reinforcement Contingency Light (one each for Schedule 1 and Schedule 2)

When this little green light is on, pressing the **S* Activate** button will immediately operate the food magazine. When this light is off, pressing the **S* Activate** button "arms" the response key. The next peck will then be followed by the operation of the reinforcement magazine. The armed state of the key is indicated by the flashing of this little green light.

Data Display

The initial display on the Control Computer indicates what schedule will run when you press **Start**. If the schedule display does not appear on your data display, press **Stop/Clear** twice (5 seconds apart). Consecutive presses on the **Schedule Selection** button will then rotate through the available schedules.

While you are running your session, the control computer displays information that you will need to carry out the experiment on the display.

After your session is over and you press **Stop/Clear** once, your data appears on the display. When the data at the end of a session fills two or more screens, use the **Up Arrow** and **Down Arrow** below the display to scroll the data window up or down.

You need not read through all possible data displays at this point. Return to read about the ones you will use just before starting each experiment. At this point, simply skip on to page 57.

Simple Schedule: Dark Key
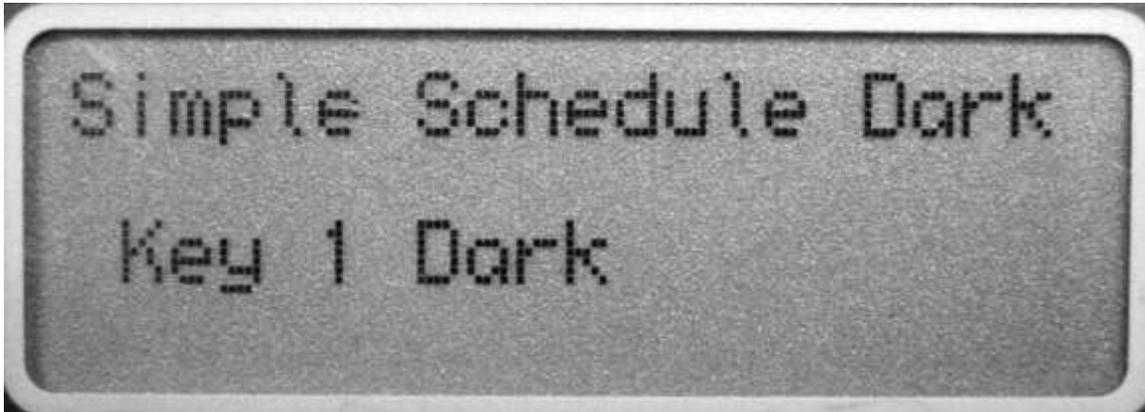
Run Data (Simple Schedule: Dark Key)

While the experiment is running, the left portion of the top line indicates how many reinforcers have occurred (2). The second line of the display window indicates the elapsed time (15 seconds) and cumulative pecks in the current trial (0) and the bottom line indicates the total elapsed time (27 seconds) and cumulative pecks across the entire session (21).
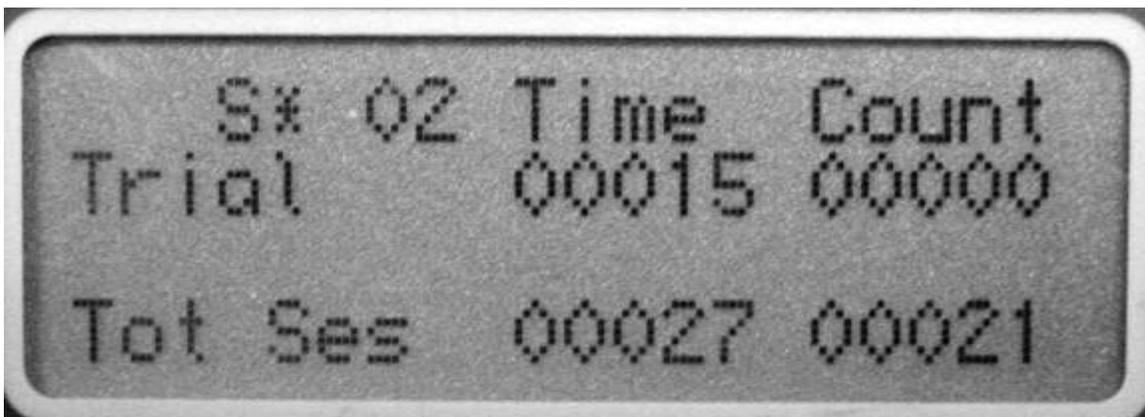
End Data (Simple Schedule: Dark Key)

After the experiment ends and the **Stop/Clear** button is pressed once, the display window indicates:
1. the schedule, key and key color
2. the total session duration
3. the total number of reinforcers,
4. the total number of responses,
5. the overall response rate in responses per second (R/s), and
6. the overall reinforcement rate in reinforcers per minute (r/m).

```
Simple Sch: K1 Dark
TL Sess Dur 12
    Rein 2 Rsp 21
R/s 1.74 r/m 9.94
```
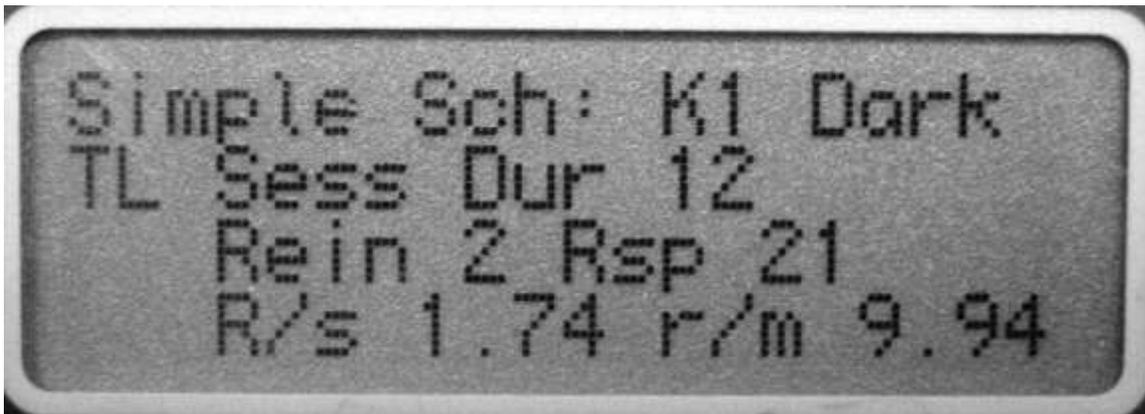
Simple Schedule: Key 1 Red

A flow chart detailing how to change the key color is given at the end of the various Data Display settings.

Run Data (simple schedule)

    While the experiment is running, the left portion of the top line indicates how many reinforcers have occurred (4). The second line of the display window indicates the elapsed time (32 seconds) and cumulative pecks (0) in the current trial. The bottom line indicates the total elapsed time (55 seconds) and cumulative pecks (46) across the entire session.

End Data (simple schedule)

After the experiment ends and the **Stop/Clear** button is pressed once, the display window indicates:
1. the schedule, key and key color
2. the total session duration
3. the total number of reinforcers,
4. the total number of responses,
5. the overall response rate in responses per second (R/s), and
6. the overall reinforcement rate in reinforcers per minute (r/m).

```
Simple Sch: K1 Red
TL Sess Dur 23
    Rein 4 Rsp 46
    R/s 2.00 r/m 10.4
```

Multiple Schedule: Manual

A flow chart detailing how to change the key color is given at the end of the various Data Display settings

Run Data (Multiple Schedule Manual: Schedule 1)

While the experiment is running, the first line indicates the total session duration (44 seconds) and the total reinforcers (7) in both schedules combined up to that time. The second line indicates which of the two schedules of the multiple schedule is running (S1), and the number of reinforcers that have occurred in that schedule (4). The third line of the display window indicates the elapsed time (12 seconds) and cumulative pecks (1) in the current trial. The bottom line indicates the total elapsed time (31 seconds) and cumulative pecks (30) across the entire session for Schedule 1.

Run Data (Multiple Schedule Manual: Schedule 2)

While the experiment is running, the first line indicates the total session duration (70 seconds) and total reinforcers in both schedules (8) combined up to that time. The second line indicates which of the two schedules of the multiple schedule is running (S2) and the number of reinforcers that have occurred in that schedule (3). The third line of the display window indicates the elapsed time (14 seconds) and cumulative pecks (0) in the current trial. The bottom line indicates the total elapsed time (26 seconds) and cumulative pecks (24) across the entire session for Schedule 2.

End Data (Multiple Schedule Manual: Schedule 1) (top of page)

At the end of a multiple schedule session, after the **Stop/Clear** button is pressed once, the data for Schedule 1 is displayed in the upper portion of the data window. This upper display indicates for Schedule 1, the time in that schedule (43 seconds), the number of reinforcers (5), the number of responses (36), the number of responses per second (.83), and the number of reinforcers per minute (6.96).

34

End Data (Multiple Schedule Manual: Schedule 2) (middle of page).

The middle portion of the display is obtained by pressing the Down Arrow located below the display. The middle portion of the display is for Schedule 2, the time in that schedule (13 seconds), the number of reinforcers (3), the number of responses (24), the number of responses per second (1.88), and the number of reinforcers per minute (14.0). The upper display can be recovered by pressing the **Up Arrow**.

End Data (Multiple Schedule Manual: Total Session) (bottom of page).

The bottom portion of the display is obtained by pressing the Down Arrow again. The bottom portion of the display indicates the total session duration (56 seconds), number of reinforcers (8), number of pecks (60), and the overall pecks per second (1.07) and reinforcers per minute (8.58) for both schedules combined. The upper displays can be recovered by pressing the **Up Arrow**.

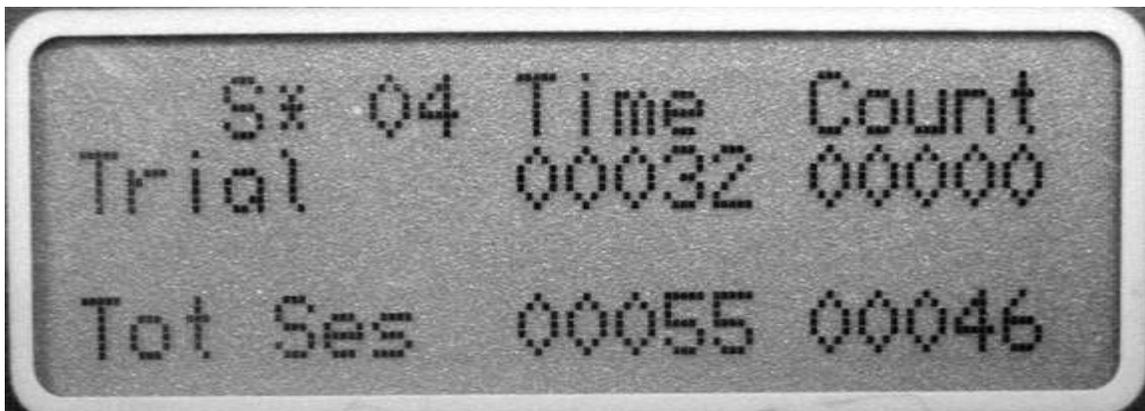# Multiple Schedule

A flow chart detailing how to change the key color is given at the end of the various Data Display settings

Run Data (Multiple Schedule: Schedule 1)

    While the experiment is running, the first line indicates the total session duration and the total reinforcers in both schedules combined up to that time. The second line indicates which of the two schedules of the chain schedule is running, and the number of reinforcers that have occurred in that schedule. The third line of the display window indicates the elapsed time and cumulative pecks in the current trial. The bottom line indicates the total elapsed time and cumulative pecks across the entire session for Schedule 1.

Run Data (Multiple Schedule: Schedule 2)

While the experiment is running, the first line indicates the total session duration and total reinforcers in both schedules combined up to that time. The second line indicates which of the two schedules of the multiple schedule is running and the number of reinforcers that have occurred in that schedule. The third line of the display window indicates the elapsed time and cumulative pecks in the current trial. The bottom line indicates the total elapsed time and cumulative pecks across the entire session for Schedule 2.

End Data (Multiple Schedule: Schedule 1) (top of page)

At the end of a multiple schedule session, after the **Stop/Clear** button is pressed, the data for Schedule 1 is displayed in the upper portion of the data window. This upper display indicates for Schedule 1, the time in that schedule, the number of reinforcers, the number of responses, the number of responses per second, and the number of reinforcers per minute.
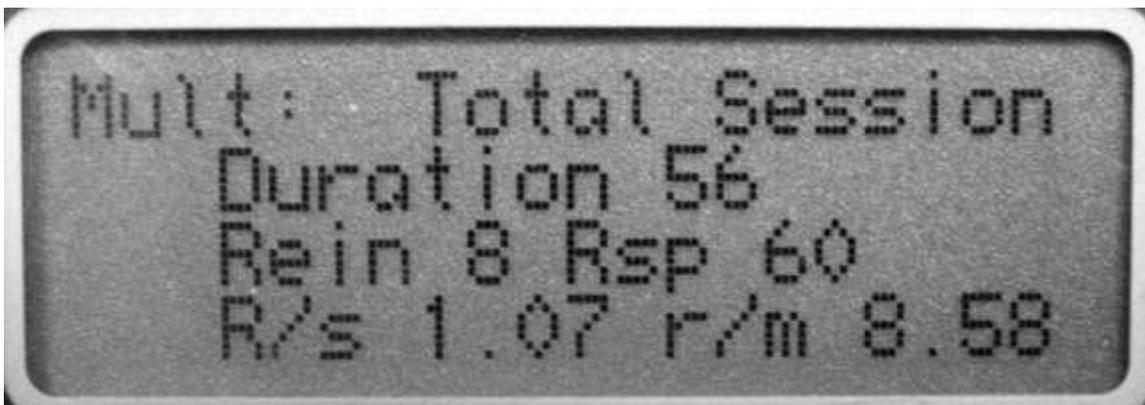
End Data (Multiple Schedule: Schedule 2) (middle of page).

    The middle portion of the display is obtained by pressing the **Down Arrow** located below the display. The middle portion of the display for Schedule 2, the time in that schedule, the number of reinforcers, the number of responses, the number of responses per second, and the number of reinforcers per minute. The upper display can be recovered by pressing the **Up Arrow**.

```
Mult: S2 K1 Green
      S2 Dur 10
      Rein 2 Rsp 22
      R/s 2.11 r/m 11.5
```

End Data (Multiple Schedule: Total Session) (bottom of page).

    The bottom portion of the display is obtained by pressing the **Down Arrow** again. The bottom portion of the display indicates the total session duration, number of reinforcers, number of pecks, and the overall pecks per second and reinforcers per minute for both schedules combined. The upper display can be recovered by pressing the **Up Arrow**.

```
Mult:  Total Session
       Duration 50
       Rein 5 Rsp 59
       R/s 1.18 r/m 6.02
```

Chain Schedule


```
Chain Schedule:
    Sched1: Key1 Red
*   Sched2: Key1 Green
```

A flow chart detailing how to change the key color is given at the end of the various data Display settings

Run Data (Chain Schedule: Schedule 1)

    While the experiment is running, the first line indicates the total session duration and the total reinforcers in both schedules combined up to that time. The second line indicates which of the two schedules of the chain schedule is running, and the number of reinforcers that have occurred in that schedule. The third line of the display window indicates the elapsed time and cumulative pecks in the current trial. The bottom line indicates the total elapsed time and cumulative pecks across the entire session for Schedule 1.


```
Tot Dur 00058 S* 08
S1 S* 04 Time   Count
Trial       00017 00001
Tot S1      00027 00037
```

Run Data (Chain Schedule: Schedule 2)

While the experiment is running, the first line indicates the total session duration and the total reinforcers in both schedules combined to that time. The second line indicates which of the two schedules of the chain schedule is running and the number of primary reinforcers that occurred. The third line of the display window indicates the elapsed time and cumulative pecks in the current trial. The bottom line indicates the total elapsed time and cumulative pecks across the entire session for Schedule 2.
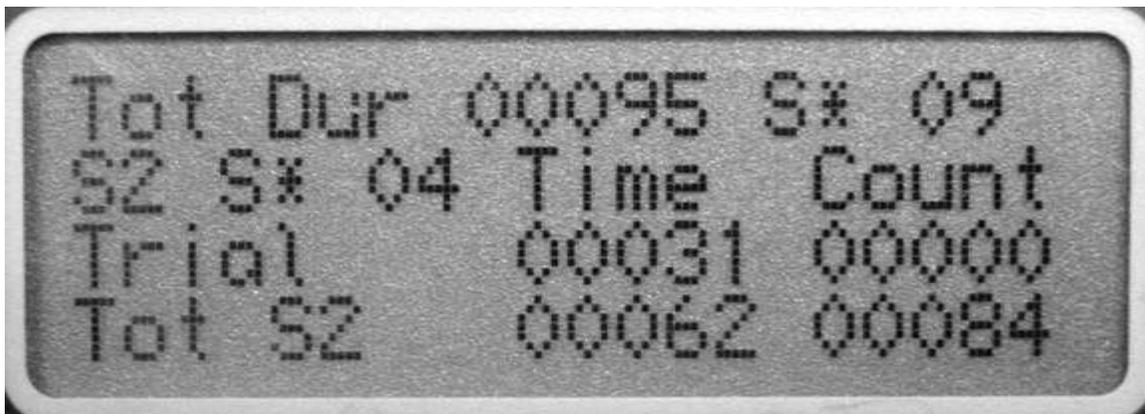
End Data (Chain Schedule: Schedule 1) (top of page)

At the end of a chain schedule's session, after the **Stop/Clear** button is pressed, the data for Schedule 1 is displayed in the upper portion of the data window. This upper display indicates for Schedule 1, the time in that schedule, the number of reinforcers, the number of responses, the number of responses per second, and the number of reinforcers per minute.

End Data (Chain Schedule: Schedule 2) (middle of page)

The middle portion of the display is obtained by pressing the **Down Arrow** located below the display. The middle portion of the display for Schedule 2, the time in that schedule, the number of reinforcers, the number of responses, the number of responses per second, and the number of reinforcers per minute. The upper display can be recovered by pressing the **Up Arrow.**
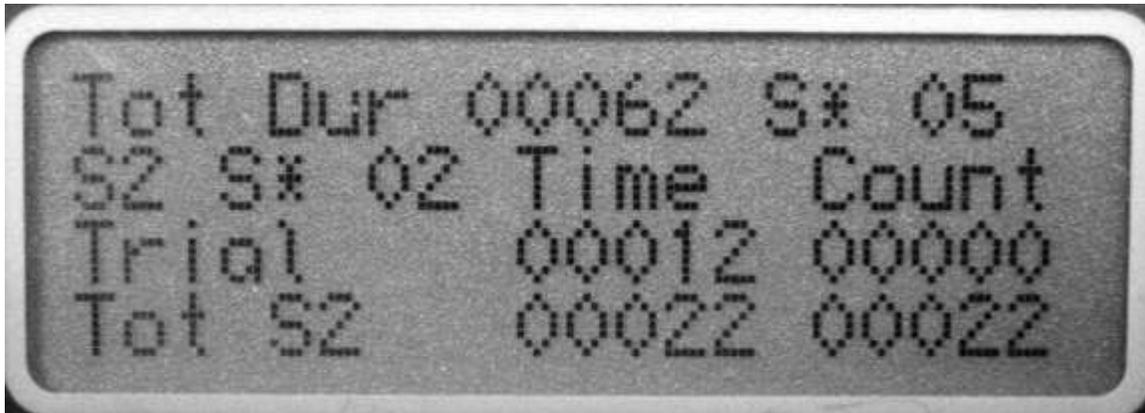
Chain: S2 K1 Green
S2 Dur 31
Rein 4 Rsp 84
R/s 2.68 r/m 7.66
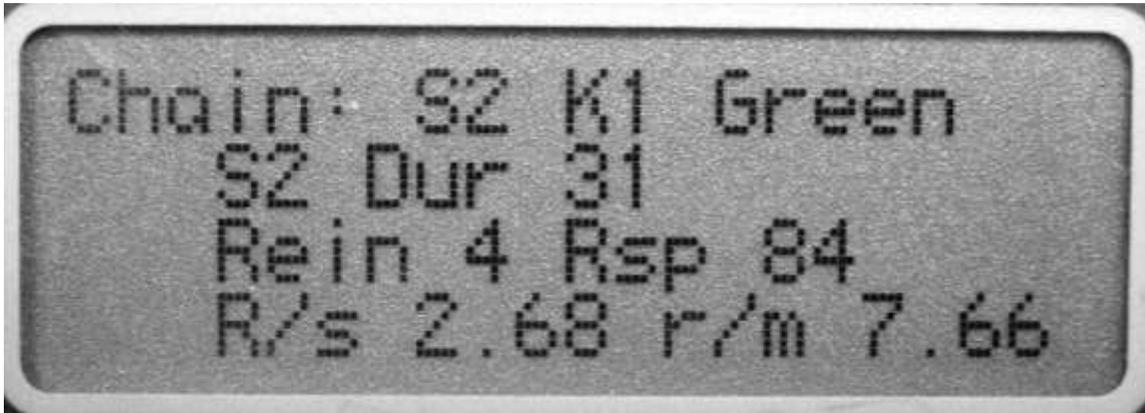
End Data (Chain Schedule: Total Session) (bottom of page)

The bottom portion of the display is obtained by pressing the **Down Arrow** again. The bottom portion of the display indicates the total session duration, number of reinforcers, number of pecks, and the overall pecks per second and reinforcers per minute for both schedules combined. The upper displays can be recovered by pressing the **Up Arrow.**

Chain: Total Session
Duration 64
Rein 9 Rsp 122
R/s 1.91 r/m 8.46

Concurrent Schedule

Note! Schedule 1 must be on Key 1 and be red, while Schedule 2 must be on key 2 and be green for your initial procedures. See flow chart at the end of the concurrent schedule data displays for how to obtain those settings if the display does not appear as it does in the above figure. The flow chart is also available in the apparatus set-up section of Lab 7.

Run Data (Concurrent Schedule)
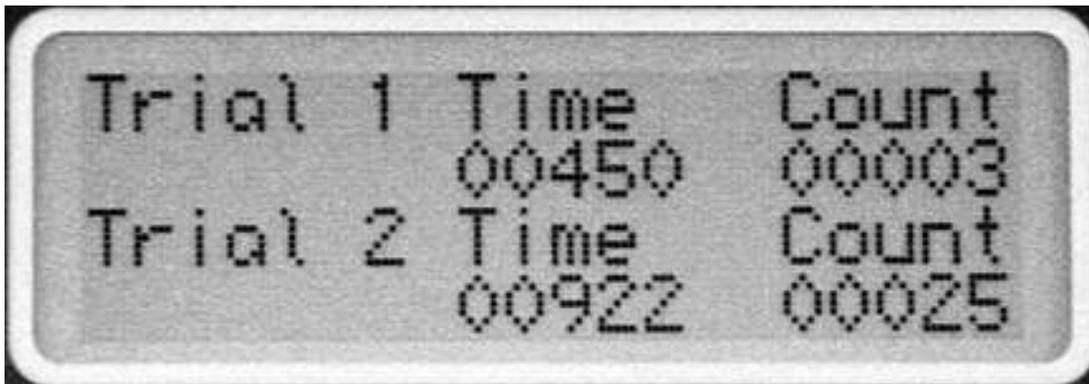
While the experiment is running, the data from the left key are provided in the top two lines. The data for the right key are provided in the bottom two lines. The upper left of the above display indicates that you are in the first trial on the left key (i.e., no reinforcers have occurred for the left key pecks so far). The time since the last reinforcer (in this case, since the start of the session) is 36 seconds and 15 pecks have occurred on the left key. The bottom two lines indicate that you are in trial 2 on the right key (i.e., one reinforcer for right key pecks has occurred so far) and 20 seconds has elapsed since the last reinforcer on the right key and 8 pecks have occurred since the last reinforcer on the right key.
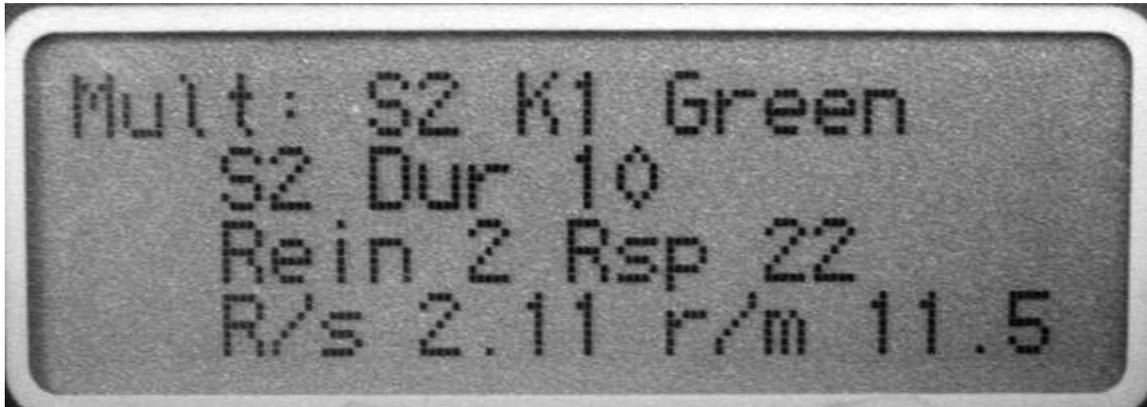
End Data (Concurrent Schedule: Schedule 1) (top of page)

At the end of a concurrent schedule session, after the **Stop/Clear** button is pressed, the data for Schedule 1 is displayed in the upper portion of the data window. This upper display indicates for Schedule 1, the total time in that schedule, the number of reinforcers, the number of responses, the number of responses per second, and the number of reinforcers per minute.
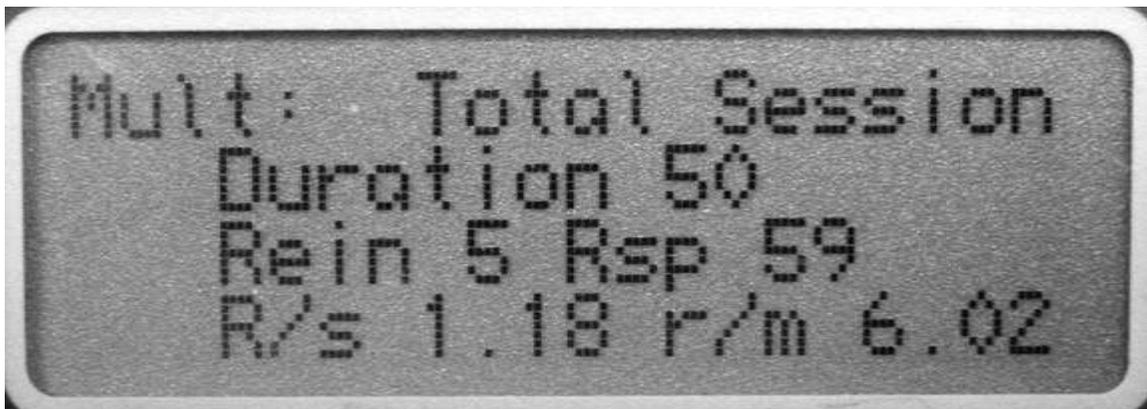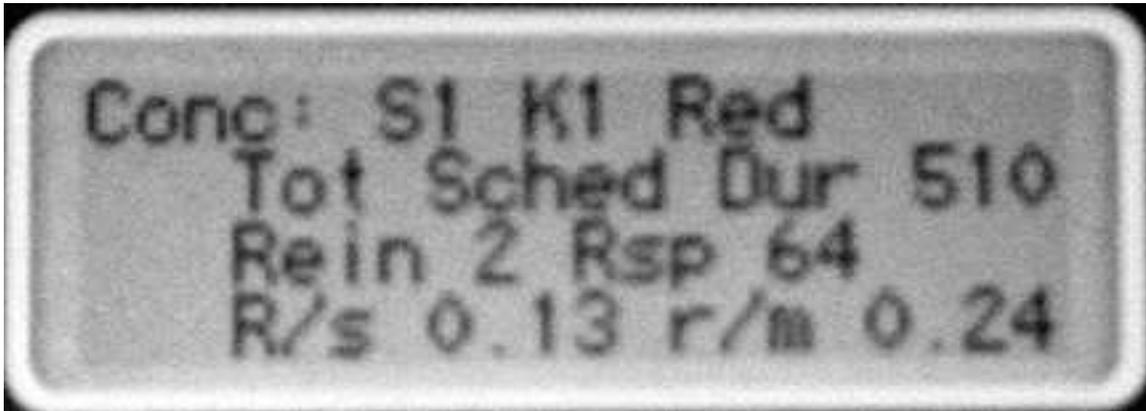

End Data (Concurrent Schedule: Schedule 2) (middle of page)

The middle portion of the display is obtained by pressing the **Down Arrow** located below the display. The middle portion of the display provides the data for Schedule 2: the total time in that schedule, the number of reinforcers, the number of responses, the number of responses per second, and the number of reinforcers per minute. The upper display can be recovered by pressing the **Up Arrow.**
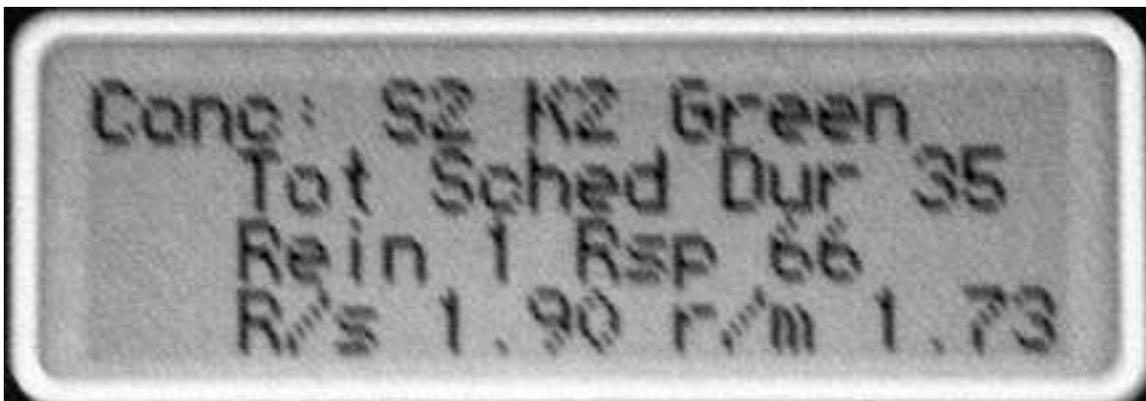
Flow Chart for Adjusting the Key Color

The computer will almost always turn on the right color light, however occasionally it will become confused. Use this procedure if a key light color is wrong.
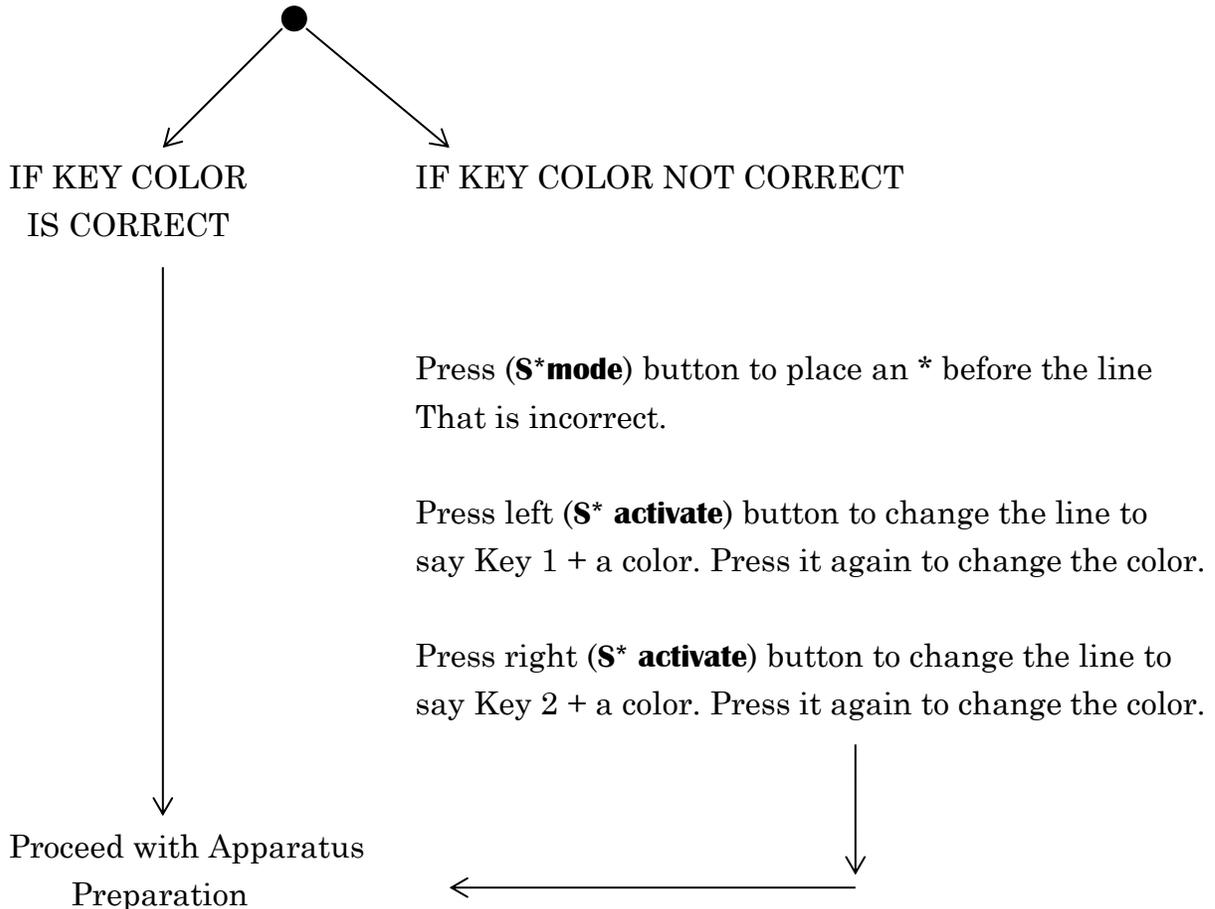
IF KEY COLOR
  IS CORRECT

IF KEY COLOR NOT CORRECT

Press (**S*mode**) button to place an * before the line
That is incorrect.

Press left (**S* activate**) button to change the line to
say Key 1 + a color. Press it again to change the color.

Press right (**S* activate**) button to change the line to
say Key 2 + a color. Press it again to change the color.

Proceed with Apparatus
   Preparation

3. Turn the cumulative recorder paper drive switch on (up).
4. Carefully remove the pen caps and place them in the container.
5. Press **Start**.
6. If you can't get it to work correctly, ask a lab assistant to help you.

Student ID _____ SECTION ____
Date _____

Lab Exercise 1
Arithmetic Procedures
This exercise is due on ^^January 15 and is worth 25 points.

Fill out the three items in Part A, then answer the 5 questions in part B. Tear out this page (Part A) (Page 45) and Part B (page 47) and turn them in with your Daily Data Sheet on January 15.

Part A: Standard and Cumulative Data

Standard and Cumulative Counts
Cumulative means to add everything up. To find your cumulative earnings over a month, you add up how much you earned each week over the month. Note that to get <u>cumulative</u> counts you must add each day's response to the previous total, just like cumulative earnings. Complete the table below. (The last number should be 30.)

1.

Day	Number of Responses	Cumulative Number of Responses
1	5	5
2	3	8
3	0	8
4	2	10
5	6	____
6	3	____
7	1	____
8	0	____
9	2	____
10	8	____
Total	30	30

(continued on reverse side)

Plots of Cumulative and Standard Data

Plot the numbers from the left column of the table on the previous page into the figure below. Be sure to connect the dots with a solid line.

2.

Figure 1

Number
of
Responses

10
9
8
7
6
5
4
3
2
1

1 2 3 4 5 6 7 8 9 10
Days
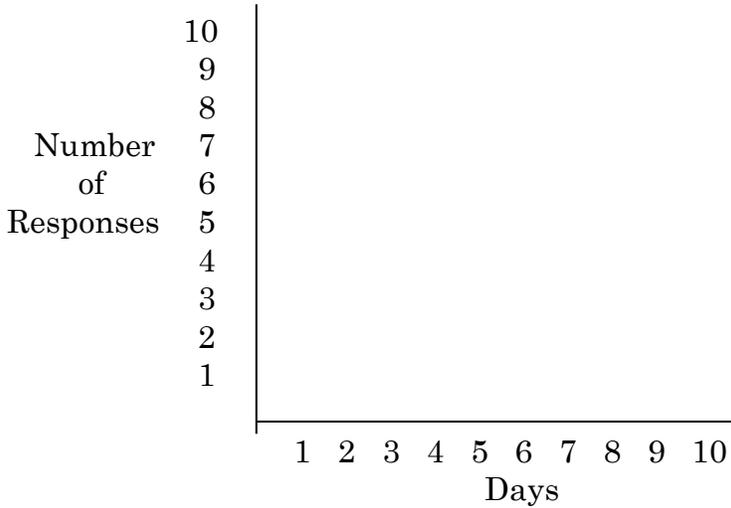
Plot the numbers from the right column of the table on the previous page (cumulative count) into the figure below. Be sure to connect the dots with a solid line.

3.

Figure 2

Cumulative
Number of
Responses
(total up to
that day)

30

25

20

15

10

5

1 2 3 4 5 6 7 8 9 10
Days
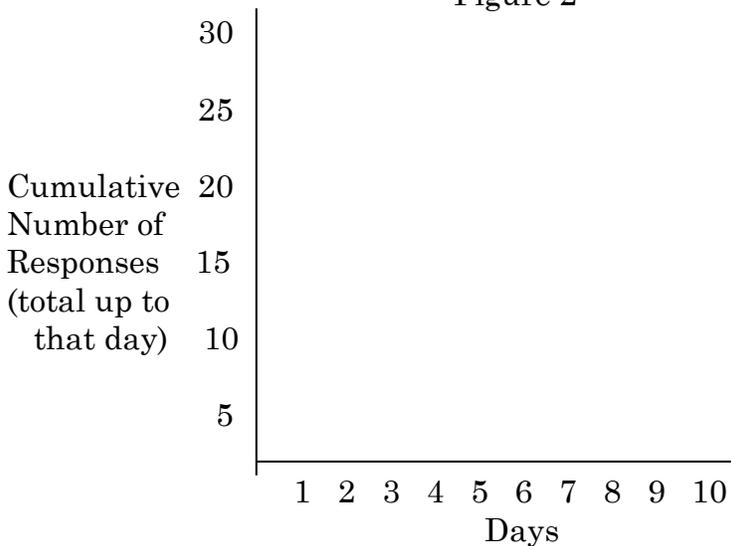
Note the following differences between the graphs you have just drawn:

1. On days 3 and 8, when zero responses occurred, the cumulative graph did not go down to zero but stayed flat. On cumulative graphs, *the line never goes down*, it either stays the same or increases.

2. Look at days 9 and 10. On the cumulative graph, the line went up slightly on day 9 and more steeply on day 10. On cumulative graphs, the steepness of the line indicates the rate of increase.

3. Notice that the last point (day 10) on the cumulative graph is the same as the total number of responses over the 10 days.

Part B Data Analysis

How to calculate a specific percentage weight
Bird's ad lib weight = 453 grams
Desired percent 80%
453 grams x .80
Bird's 80% weight = 362.4 grams

How to calculate a weight's percentage of the ad lib weight
Bird's current weight = 432 grams
Bird's 100% weight = 453 grams
$\frac{432}{453}$ = 95%

How to subtract time
Note that time is in 60s not 100s
End Time =   3:06 $\longrightarrow$ 2:66
Start Time =   2:47 $\longrightarrow$ 2:47
Elapsed Time =   19 minutes

How to calculate rate of responding

Number of responses = 351
Number of minutes = 14
$\frac{351}{14}$ = 25 responses per minute

How to calculate reinforcement rate

Elapsed time in minutes = 5
Number of reinforcers = 16
$\frac{16}{5}$ = 3.2 reinforcers per minute

Answer the following questions:

1. **Calculating a bird's 80% weight**
    Bird's ad lib weight = 611 grams
    Desired percentage = 80%
    What is the bird's 80% weight?

2. **Calculating a weight's percentage of ad lib**
    Current weight = 728
    Ad lib weight = 805
    What percentage of ad lib is the pigeon?

3. **Subtracting Time**
    4:03
    2:47

    What is the difference in minutes?

4. **Rate of Responding**
    Number of responses = 324
    Number of minutes = 13
    What is the rate of responding?

5. **Rate of Reinforcement**
    Elapsed time = 6 minutes
    Number of reinforcers = 21
    What is the rate of reinforcement?

Cumulative Recorder

The cumulative recorder is a device used to automatically record and graph the behavior of an individual in real time (while it is occurring). The cumulative recorder is so named because it draws a record of the total number (or cumulative number) of responses up to the present time. This is analogous to the total amount of money you have earned so far across each day of a year. Sometimes your total may jump up day after day because you are working each day and sometimes you may go a week or more with no change in your bank account because you are not working.

Use of a cumulative recorder device for recording data was pioneered by B. F. Skinner and is extremely useful in real-time laboratory investigations of behavior because it is much easier to understand how behavior is changing in an individual when we can see it represented as a line changing in space while the behavior is actually occurring.

We use a cumulative recorder in this lab for those reasons. It provides an instant and permanent record of moment-to-moment changes in the pigeon's rate of key pecking while it is actually happening. In that way, we can easily see the impact of the consequence of behavior on that behavior. You can see for yourself that when a reinforcer follows a behavior, that behavior starts to occur at a higher rate.

General Description

The cumulative recorder works by slowly feeding paper out while simultaneously moving the response pen across the paper a small step each time the pigeon pecks.

Response and Event Pen

These pens work automatically. The response pen (the left of the two pens) records pecks by advancing a tiny step across the paper each time the pigeon pecks. The event pen (on the right) gives a record of session length by deflecting slightly when you turn the equipment on, and returning to its baseline when you turn the equipment off. Each key peck moves the response pen 1/4 of a millimeter across the paper to allow about 525 responses before the pen automatically resets back to the right side. The paper roller turns about 30 centimeters per hour, so that after a 50-minute session, the record will be about 9-10 inches long. If a pen fails to write or runs out of ink, ask the lab assistant to repair it. Do <u>not</u> attempt to repair it yourself.

Paper Drive Switch

To turn on the recorder, locate the toggle switch on the lower right side of the front of the recorder. Flipping the switch <u>up</u> turns ON the paper drive motor. The

paper moves very slowly, so the only way to tell if the motor is on is to listen for a faint hum and the turning of clock gears. Always be sure to turn the paper drive off (switch down) when you finish the session. You are responsible for turning off the recorder each time you use it.

Pen Caps

When you turn on the recorder, carefully lift the pens and remove the two plastic caps from the pen tips. Place them in the small container located in front of the recorder so that you do not lose them. At the end of the session, carefully lift the pens and replace the caps. This prevents the ink from either leaking or drying out in the pen. Be careful when you lift the pens; they may break. You are responsible for replacing the pen caps each time you use the recorder, so be sure not to lose the pen caps. Lab assistants will confirm that you replaced the caps at the end of each lab period.

Reset Button

The reset button is used to move the response pen back to its starting position on the right. To locate the reset button, raise the lid and look in at the top of the recorder. The black reset button is roughly in the center of the top. To reset the pen at the end of the session, press the button and hold it down until the pen moves all the way back to the right side of the paper.

Viewing Cumulative Records

50
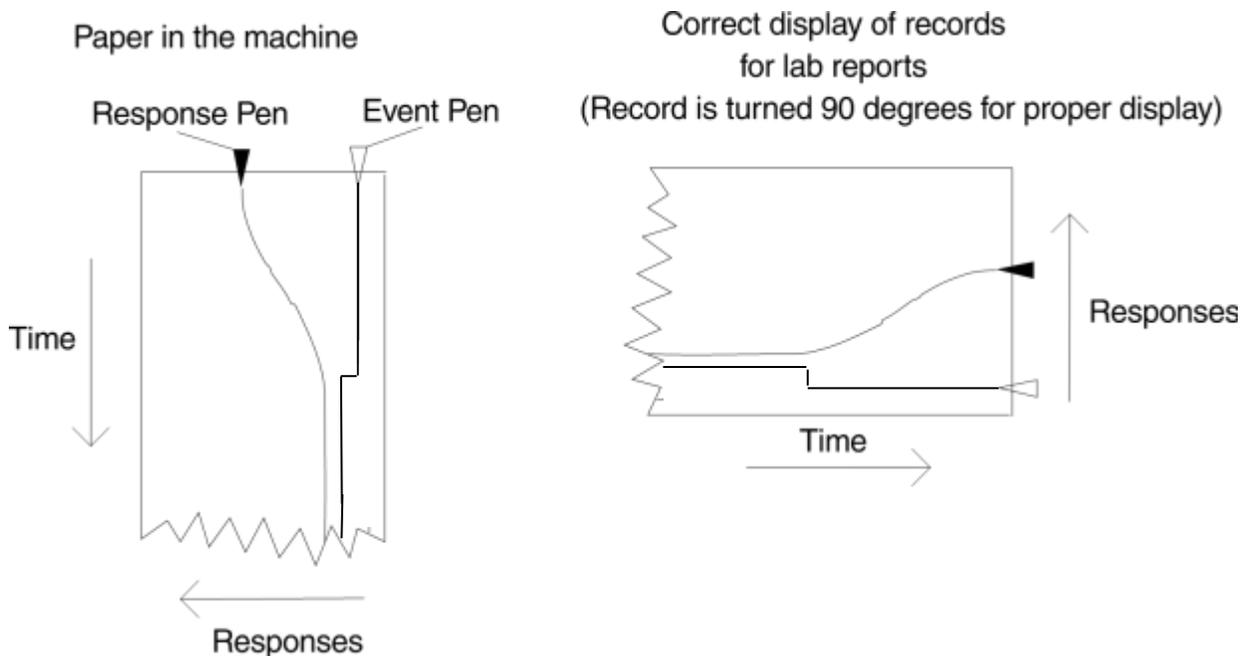
Note that when you are reading or displaying the cumulative record, it is turned 90° from the way it comes out of the machine. Your response line should rise to the right. The event pen line should be on the bottom. The length of the deflected event line tells you the session length. The height of the "step" line gives you the total number of responses made. The angle or slope of the "step" line indicates the rate of response. Reinforcers are indicated by a momentary deflection of the response pen that produces a pip or hatch mark.
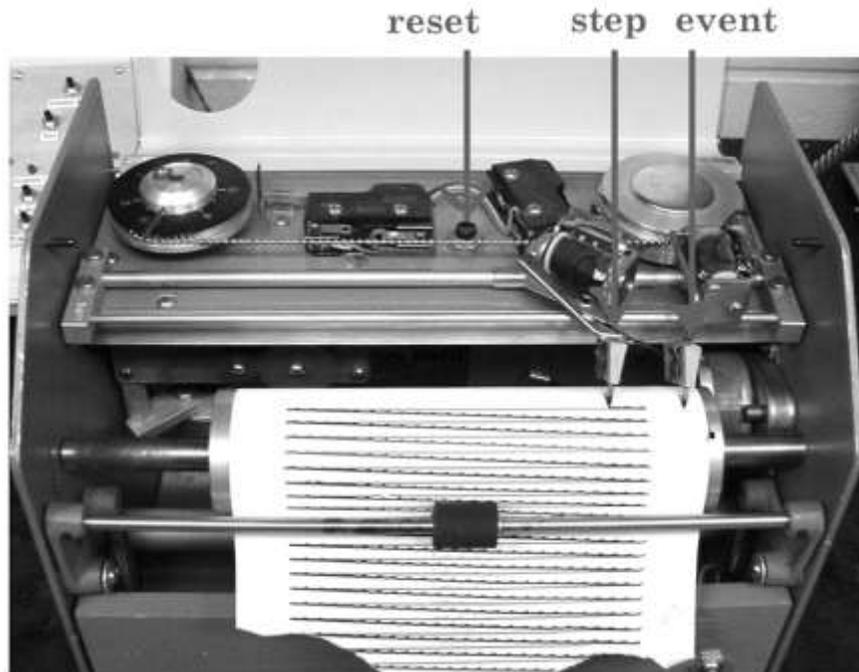
Preparing the Cumulative Recorder

1. Turn on the paper drive switch located in the right front of the recorder (switch up).
2. Lift the recorder lid.
3. Reset the recorder (push down the button in middle of the top plate).
4. Carefully remove the pen caps and place them in the container in front of the recorder on the top of the pigeon chamber.
5. Close the recorder lid.

Obtaining the Cumulative Record and Shutting Down the Recorder

1. Lift the recorder lid.
2. Reset the recorder (button in middle of the top plate).

3. Turn off the paper drive switch located in the right front of the recorder (switch down).
4. Lift the tension roller slightly away from the paper.
5. Do not lift the pens.
6. Pull some paper out so you can tear it off.
7. Tear off the record of your session.
8. Replace the plastic caps on the pen tips.
9. Close the recorder lid.

Custody of Your Equipment

There will be spot checks of your care of the equipment you use. This includes:

Chamber
    No damage
        When you close the chamber door, sometimes it catches on the roof of the chamber. Attempting to snap the latch when that happens will then damage the latch. If the door does not slide under the roof of the chamber, simply lift the roof of the chamber slightly before attempting to close and latch the door.
    Clean with no paper extending out
    Hopper filled and no pellet dust
    Door shut and latched

Food Hopper
You must strain any food pellets you put into the chamber's food hopper, otherwise powder will build up in the magazine and the bird may not get much to eat during a reinforcement cycle. Examine the food magazine directly below the food aperture. There should be pellets of food visible in the magazine and very little food powder.

Control Computer
    No damage

Cumulative Recorder
    No damage
    Pen caps on pens
    Reset
    Paper motor off
    Lid closed

Daily Apparatus Protocol

Each day you are to do the following things. Necessary modifications to this basic procedure will be detailed in each lab assignment. Sometimes you will change the apparatus before a session; sometimes you will change the apparatus during a session. In each case, you will be instructed what to do in the apparatus preparation section of the lab. If you read the directions, you will never be caught by surprise.

To Start a Session:
1. Fill in the first section of your daily data sheet (see Pages 68 and 69).
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule you wish to run by repeatedly pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps and place them in the container in front of the recorder.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put the pigeon into chamber and press **Start**.
11. Assure that the little green light is off – press **S* Mode** if necessary.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, tare scale, weigh it, and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Refill the food hopper with strained pellets.
10. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Data Collection and Programming Sheets

There are several forms that are provided with the labs. They provide a simple way for you to record data or determine when to do things while running your experiments.

Daily Data Sheet

See the sample daily data sheet on pages 68 and 69.

<u>Both</u> you and your lab partner must complete a daily data sheet and <u>both</u> you and your partner must obtain a cumulative record (or copy) of your bird's performance each day you work with the pigeon. At the end of the lab session, **always have the lab assistant initial the data sheet (each partner will have their own) and the cumulative record. Each partner in attendance when the cumulative record was generated are to put their student number on the cumulative record. The lab assistant will initial the student numbers <u>of attending students</u>. It is the only way you can obtain credit for attending the lab and the work you have done**. The data sheets and cumulative records for each experiment must be turned in with the lab reports. If you miss a lab and your lab partner works with the pigeon alone, be sure to get a copy of the data sheet and cumulative record so that you will have complete information to write the lab report. However, recall that you must attend all labs, as a result, you will not accrue the points available for that lab and those missed points can affect your final grade in the course. If you miss a lab day, make arrangements to come in on a non-lab day to make up that training session with your pigeon.

If you run your bird two days a week, you will have 2 data sheets and 2 cumulative records per week. Each data sheet and cumulative record will count 1 points each for a total of 50 points for the semester. If you run your bird 5 days a week, you will have 5 data sheets and 5 cumulative records per week which would total to 128 points for the semester. In addition to making the projects very much easier to accomplish, there is a large point advantage to running your subject every day, or at least as often as you can. Note that both you and our partner trying to get credit for working your bird one day when only one of you did it is cheating and will result in both of you receiving an F for the semester for the course.

Filling out the daily data sheet is pretty self-explanatory. Put your student ID number where it is called for. The "purpose of the experiment" question is so that you stay focused on why you are doing the experiment and not simply doing

something that you are told. The "schedule of reinforcement" question draws attention to the procedure while the "what behavior are you trying to obtain" question focuses you on exactly what specific behavior are you trying to obtain that day, so it's easier to think about what you should be accomplishing rather than slipping into autopilot. The last two questions keeps you focused on where you are with respect to the deadline and the rest of the class so you can feel good if you are ahead, or be reminded to come in extra days if you are behind the rest of the class.

Sample Daily Data Sheet

Student ID Number_____ Experiment # _____ Session # _____

Date _____

| Lab Assistant's Initials Here |
| Proceed OK _____ Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____
_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Logging and Programming Sheets

Behavior Logging Sheets

During one procedure (the first day of Experiment 1) you are to record what you see the pigeon doing in each consecutive minute for 15 minutes. This sheet is located at the end of the experiment that uses it. A thumbnail is shown below.

Response Logging Sheets

During some procedures you are to record the number of key peck responses in each consecutive minute throughout the session. For these sessions, you will need to use a Response Logging Sheet. These sheets are provided in your Lab Manual at the end of the lab that uses them. Watch the trial time indicator on your control computer to correctly keep track of the passage of time. **You may not use a cell phone under any circumstances.** Write down the number of responses in each time unit specified. A thumbnail is shown below.

Programming Sheets

When you run variable schedules (which you will learn about later), programming sheets containing information about when to provide reinforcers are provided in your Lab Manual at the end of the lab exercise that uses them. If the programming sheet says to reinforce the first response after 71 seconds, reinforce the first response after your computer display says 71 seconds. If the programming sheet says to reinforce the first response after 12 seconds, reinforce the first response after your computer display says 12 seconds. A thumbnail is shown below.

Laboratory Deportment

The requirements of this component of your grade are pretty much common sense and something that almost everyone would do correctly as simple common sense or at least as courtesy to their fellow students; but in the spirit of trying to get everyone an "A" in this course, and because (believe it or not) some students in the past had to be told these things. If you cannot bring yourself to do the following things, plan on losing points. You may very well lose a letter grade or more if you persist.

1. **All cell phones and electronic devices must be turned off and may not be visible. They may not be used for any reason whatsoever. You may not take them out even if you are just checking something. Having a cell phone out will be taken as evidence of cheating on your lab, and you may be assigned a lower grade, including an F, for the semester.**

2. There shall be no running conversations in the laboratory. If you must communicate with your lab partner in order to carry out the lab, no one else should be able to hear you.

3. Neither food nor drink is permitted in the lab.

4. You must come to class on time. Late is late.

5. You must not leave class early. Early is early.

6. You must come to every lab period. Cutting lab is cutting lab.

7. You must bring your lab manual every day.

8. You must read the upcoming assignment in order to know what to do.

Lab Reports

When an experiment is completed, you will write a report based on the information collected on the data sheets, response logging sheets, and cumulative records. **Detailed instructions are provided so you will know what to do and how to do it when the time comes.** Additionally, the first lab report requires only a minimal amount of work on your part. Subsequent labs systematically increase what you have to do as your skills develop.

Note that <u>you are to personally type the pre-written templates</u> **provided in this manual, that you are instructed to copy word for word, it is part of your task of completing a lab report. You are getting credit for simply typing the material word for word. Copying it from your lab partner is plagiarism and you can be given an F for the semester for not typing it yourself.** You may not tear out pages of the lab manual to avoid typing the template. The only pages from the lab manual that are turned in with your lab reports are the Daily Data Sheets. There are no exceptions.

Note that you are to provide your student ID number rather than your name.

The following guidelines will be used in grading the reports.

1. The Lab Reports must be typed, stapled, formatted correctly (including being typed double-spaced), and neat. If you do not have a computer and a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you several days to learn how to type and print a paper.

2. The Lab Reports should demonstrate comprehension of the purpose of the procedures used in the experiment.

3. Lab Reports should be concise and clear in describing procedures used in the experiment without sacrificing thoroughness.

4. The Lab Reports should demonstrate correct use of technical terms.

5. Lab Reports will receive extra credit if they show some awareness of the literature in journal articles.
    a. it will help you know what to write and how to style your writing
    b. it will give you ideas about what your data mean and kinds of things to discuss
    c. it will earn you a higher grade

In order for you to get credit for turning in your lab report, you must hand your lab reports directly to the lab assistant. Additionally, you must submit your paper to the Canvas plagiarism site.

Details that you probably already know . . . but in the event someone actually needs to be told the following in order to do well in this course:

6. The Lab Report must be turned in directly to the instructor **on time** at the beginning of the lab period. Additionally, all lab reports must be submitted to the Turnitin plagiarism checking site before the beginning of your lab period. **The deadline for both submissions is the beginning of your scheduled lab period. Any papers not turned in and on the plagiarism checking site by that time will be considered late.** For example, if you have not turned in your paper and submitted it to Turnitin at the beginning of your lab period, you will lose 10 points from your paper. You will lose 20 points for turning it in on the day following its due date. Each additional day the paper is late will result in an additional 10 point deduction. After one week, the paper gets a zero. Please be aware of the fact that the point loss from late lab reports can easily cost you an entire letter grade or more lost on your PSY221 grade. When you don't turn in your lab report on time, a week or more can pass by awfully quickly. Before you know it, you could get a zero on the paper. Please turn in your labs on time.

    You will lose more points for the paper being late than you can make up by working on your paper more.

    It is certainly not worth it to cheat, you will fail the whole course if you cheat.

    Recall that **you must give your assignments directly to the Lab Assistant for the assignment to count**. For example, leaving them in the hall does not count as turning them in. Please be reasonable. In the past unscrupulous students who didn't feel like doing their homework have claimed that they slipped it under a door, left it in a mailbox, or gave it to someone who lost it. These excuses are unacceptable. Computer crashes, attacks by Osama bin Laden or dogs that eat homework are equally unacceptable. If you want to be safe from computer crashes, attacks by crazed assassins, space aliens, or hungry dogs, plan on turning your work in early so that you have a safety margin. It will help you be prepared for the real world where there are no acceptable excuses, period.

    With the exception of the extra credit Lab 7, no lab report will be accepted for any reason after ^^April 21, 2020.

If you have been given permission to do the extra credit Lab Report 7, it will be accepted until ^^April 27, 2020.

8. **If the Lab Report has evidence that you did not do it yourself, you can expect to receive an F for the semester.** Plagiarism will not be tolerated. Plagiarism includes having an unusual similarity in style with anyone else. Students have said that the only reason their paper sounded suspiciously like their lab partner's paper was that they had talked about their lab reports and then went home and wrote them independently and that it was only a coincidence that they sounded the same from start to finish. In order to protect you from the consequences of papers that appear to be paraphrases of each other (i.e., flunking the course), you are forbidden to talk about your paper with anyone including your lab partner or anyone that took the course during a previous semester. Note that you are also forbidden to copy your own papers from previous semesters or previous lab assignments, any material from this manual that you are not specifically instructed to copy or any other copying whatsoever.

You are required to type the template yourself. Evidence that you did not type the template yourself will result in an F in this course.

9. A "Lorem Ipsum" version of a lab paper is posted on the lab room wall adjacent to the door. Your paper should look like that paper in terms of it overall appearance, font, pagination, etc.

How to Write a Lab Report

Not all of the instructions provided in this section are needed for your PSY 221 lab reports. You could skim over this section now and then come back to it when you want to know something that it provides. It will be of great help whenever you have to write a paper to professional standards.

These guidelines will be important for writing papers throughout your academic career because they are the professional publication standards issued by the American Psychology Association (The Publication Manual of the American Psychological Association, 6th Ed). Visit the APA website's tutorial "The Basics of APA Style" www.apastyle.org/learn/tutorials/basics-tutorial.aspx. Click on "View the tutorial."

For sample papers, go to:
APA's website
apastyle.org/manual/related/sample-experiment-paper-1.pdf
or
Purdue University's OWL website
https://owl.purdue.edu

These instructions concerning what you have to know is especially "overkill" for your first report, before you get feedback on how to do a lab report and before you have experience doing one. **These guidelines provide you with an ideal to work toward over the course of the semester and over your undergraduate career. Try to approach them as closely as you can, but don't worry about things that you cannot do.** While reading these descriptions of what is included in each section, observe that section in the sample paper that begins following Experiment 1 in this lab manual.

Use a 12-point serif font (for our classroom purposes, use Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point) with one-inch margins.

Print on only one side of the paper and double-space all lines. Do not skip additional lines. Staple your paper in the upper left corner. Do not bind in a cover. Do not add blank sheets. Do not print at other than 100%

Writing numbers
Generally, you should write numbers 1-9 out and you are to express

numbers 10 and above numerically. Always write the number out if it begins the sentence. Use numerals when referring to identification numbers, decimals and percentages, and dates and years.

Sample Paper

A sample paper in lorem ipsum is provided on the wall of the lab. Your paper should have the same overall appearance as the sample paper.

Title Page

The Title Page can be seen as a very very short abstract and is the first contact readers have with your paper. It should convey what the paper is about as well as who did the work. It should be simple and elegant.

1. Concise and descriptive title of the report (no more than12 words). Title font size should be the same as the rest of the text of the report. Do not capitalize articles in the title. Do not use a superfluous preamble in the title such as: "An experiment to show …"
2. Student ID number of author (your student ID number).
3. Institution where the investigation was conducted (JSU).
4. Running Head – an abbreviated title of less than 50 characters (including spaces and punctuation) printed at the top of the pages (in the header) of a published paper.

Abstract Page

Type the word "Abstract" centered at the top of a new page, capitalizing only the first letter.

The Abstract should be short, but informative. The Abstract covers what the original question was, what the answer was, and the conclusion drawn. Summarize the general procedure and the major findings in no more than 120 words. Avoid superfluous sentences such as "An explanation of the data was discussed." Do not use abbreviations in this section. This section should contain statements of the problem, method, results and conclusions.

Introduction

The Introduction section begins on a new page and the title of the paper is centered at the top of the page. Only the first letters of the title are capitalized. There is no heading labeled "Introduction."

Start with something everyone will agree with. Address yourself to psychologists who have a good general knowledge of introductory psychology, but who may not remember all the exact details then build an argument for why you are doing what you did. Be impersonal in style. Do not use interrogatory sentences

or question marks. Use declarative statements and periods instead.

The Introduction section answers the WHY questions surrounding the research. This section gives the reader enough background to understand the relevance, the point, and the meaning of the research question

Develop how your research fits into the field of psychology as a Euclidean proof. Initially present the overall subject matter and its relevance. Then develop how your research question evolved historically. Review the issue that originally raised the problem. Present the succession of answers and subsequent questions revolving around the problem. Demonstrate the importance and significance of your research question by pointing out the impact that various possible results would have. Be careful to maintain the continuity of the developing issue, and to provide adequate contact with the literature (i.e., references).

Make a case for why the procedure that you intend to use is the most appropriate method for demonstrating or determining the effect. The introduction also develops a case for the appropriateness and the necessity of the procedures used to answer the research question.

In sum, the reader must know why the research should be done and why the procedures are the right ones to do it.

Method

Type the word Method centered on the page in bold. Capitalize only the first letter. Do not start a new page.

The Method section consists of the Subjects, Apparatus, and Procedure sections. It tells the reader precisely how the experiment was conducted and all the information necessary to recognize confounds. Include everything necessary to replicate and obtain the same results and nothing that is unnecessary. Include the relevant; exclude the irrelevant. There is no text "lead in" following the word Method. The first line of the Method section is the title of the Subjects section.

Subjects

Type the word Subjects flush with the left margin in bold. Capitalize only the first letter. Do not start a new page.

Include how many, what species, the population from which they were selected, and any other pertinent details concerning the subjects in particular. Provide the information necessary to replicate the study with respect to subjects. The information should enable the reader to realize any confounds or inability to generalize because of any special property of the subjects.

Apparatus

Type the word Apparatus flush with the left margin in bold. Capitalize only the first letter. Do not start a new page.

Describe the apparatus sufficiently enough that someone could replicate your study with respect to apparatus or setting. When a "standard" apparatus is used, name it and then go on to describe it.

Describe the apparatus only insofar as it interacts with the subject. Describe the properties not what it did or what it was used for. If it was not used, do not describe it unless it was of overshadowing importance. Do not describe the way the apparatus interacts with the experimenter unless it has a direct bearing on the procedure or the results. Provide all the information necessary to allow the reader to realize any confounds or inability to generalize because of some special property of the apparatus or setting. You must use the Standard International System of Units (i.e., metric system).

Procedure

Type the word Procedure flush with the left margin in bold. Capitalize only the first letter. Do not start a new page.

The reader must know everything that happened to the subject, that is all of the information necessary to replicate the study. Procedures are written in terms of a sequence of events. Give a very brief overall view of what was done and then a detailed description. Include instructions, maintenance schedule, how the independent variable was administered, and how the dependent variable was recorded. If there were instructions given to the subjects you would quote them in this section if necessary, or refer the reader to an appendix if the instructions are more than a few sentences. Write clearly enough that anyone reading your report will be able to understand the procedure and conduct exactly the same experiment. Provide all of the information necessary to realize any confounds or inability to generalize because of some special property of the procedure. If data cannot be replicated through your procedure section your contribution cannot be considered a fact, and is of little use. The actual controlling variable was obviously unspecified.

Summarize each step in the research. This should include:
1. Session length
2. Description of the behavior studied
3. Type of reinforcer used
4. Schedule of reinforcement
5. Description of special procedures

Results

Type the word Results centered in bold. Capitalize only the first letter. Do not start a new page.

First briefly present the main trend of the findings or "take home message" with respect to the main procedural manipulation. Then logically present the relevant results of the procedure. Order your presentation with respect to

categories of results. Summarize your data. Present or show data to justify your assessment of the major trends. You must PROVE your points and not just state them. Provide quantitative measures. Present evidence supporting the reliability of the data, and the amount of variance your descriptions will account for. Additionally provide information that will allow the reader to realize the magnitude of the effect that would be necessary before you were willing to present it as something the reader should consider. Do not introduce theory or interpretations in this section. This is a data section.

Keep in mind that your topic is Psychology and that the behavior of the organism (not the organism itself) is the dependent measure. Describe the behavior, not the organism. A handy (but sometimes difficult to do) rule of thumb is "you should avoid altogether any reference to the subject (the pigeon) in the results and discussion sections." For example, "the response rate increased ..." rather than "the pigeon pecked faster."

1. In the Results section summarize the data collected. You should summarize information by reporting average rates of response where they are appropriate.
2. It is often useful to refer to tables and graphs in describing the results. The tables and graphs appear at the end of the report, but they are referred to in this section.

Discussion

Type the word Discussion centered in bold. Capitalize only the first letter. Do not start a new page.

The Discussion section answers the question "SO WHAT?" or "WHAT OF IT?" It discusses what the results of the research mean. Open this section with a clear statement of support or lack of support of the original hypothesis presented in the Introduction, the take home message for the entire research paper. Discuss the questions that were asked in the introduction, what the answers were, and in what sense the data answered these questions. Recap data to prove the answer to the question regardless of whether they were affirmative or negative. Recap the reliability and generality of your results. It is necessary to non-statistically substantiate your results and their reliability and generality by citing other similar or related studies and their findings. Point out similarities and differences between your findings and other findings and relate those differences to the procedural differences. Cite examples of other similar results. Discuss how your findings are similar to other kinds of research. Help substantiate your conclusions by pointing out functional similarities between your findings and other published research and the relevance of your conclusions to understand other research.

Two rules of thumb: 1. the amount of coverage of something should reflect its importance. Do not spend two sentences on your primary results and six

paragraphs on the one aberrant subject. And 2) your task is to show how your findings are consistent with the literature, not how they stand alone. No matter how unique your results appear to you, they are very likely to be the result of well-known processes. Science progresses by understanding how what it knows explains new phenomenon not how new phenomenon violate everything that has ever been learned

     The data will answer some questions more than others. Talk about the conclusions which can be made from the data, e.g., "it may be concluded that this contingency has the effect of increasing the rate of ..." Make partial conclusions. State the limitations, qualifications, and generalizations of your statements. If necessary, describe the limitations in detail. For example, a potential limitation is that the results may be peculiar to the procedure.

     Discuss the certainty with which the data answer the various questions. Use "but" and "however" type sentences, e.g., "these data suggest this, however, such and such may not have been controlled." What other alternative interpretations are there? Rule them out with evidence or explore their potential. In the end you may have discovered a better question rather than a better answer. If that is the case, discuss exactly that.

     This section is your conclusion and not your results. It is what you **think** about your results and what they **mean**, not just a repeat of the results section. Remember that your data are real and not hypothetical. It is assumed that you have thought about the ramifications and implications of your research more than anyone else, however never be final or eternal about your conclusions. Never end a discussion with a gratuitous appeal for more research to be done. Generally, you want your Discussion to be upbeat and about what you found not an extended self-criticism and not a cliché that more research is better than less research.

References

     Type the word References centered on a new page. Capitalize only the first letter.

     The text should make adequate contact with relevant literature through references. You must provide the source of your information so that interested readers can go to the original sources themselves to expand or confirm what you said. Science does not believe things just because someone said them, but rather because the facts have been substantiated by many independent investigators with "different axes to grind." Findings must be understandable and replicable to both people who agree with your interpretation and to those who disagree.

     Examples below cover the common types of entries. Pay very close attention to the format. You will always have at least one reader that is scandalized if you don't capitalize something correctly or use the wrong punctuation mark. Note that the names of the journals are written out in full. Also note what is and what is not capitalized (e.g., in book titles, only the first letter of the first word is capitalized and also the first letter following a colon; in journals the first word of the title is

capitalized). Book titles, names of journals, and volume numbers of journals are italicized.

Never used someone's first name and never indicate what university they are from in the text of your paper. It is inappropriate familiarity and usually taken as an attempt to bolster an argument by citing a well-known university.

When an article is referred to in a paper, the complete reference must be included in the Reference section at the end of the paper. Always use American Psychological Association (APA) style as shown below. (See *Publication Manual of the American Psychological Association,* Sixth Ed. 2010)

Reference to a Book

Ferster, C., & Skinner, B. F. (1957). *Schedules of reinforcement.* New York, New York: Appleton-Century Crofts.

Reference to a Journal Article

Nevin, J. A. (2010). The power of cooperation. *The Behavior Analyst*, *33*, 189-191.

Reference to a Chapter in an Edited Book

Odum, Al. L., & Baumann, A. A. L. (2010) Delay discounting: State and trait variable. In G. J. Madden & W. K. Bicke (Eds.). *Impulsivity: The behavioral and neurological science of discounting* (pp. 39-65). Washington, DC: American Psychological Association.

Tables and Figures

Present figures and tables if appropriate. Figures and tables are intended to make the information presented in the results section clearer, more obvious, or more easily understood. Figure captions should be included on the same page as the figure, but below the figure.

Tables

Type Table *"x"* (where *"x"* is the number of the table, e.g., 1, 2, 3) left justified at the top of a new page. The next line should provide a descriptive title for the table typed in italics.

You can often summarize information by using a table. The table should be able to standalone without reference to the text. Table information supplements but does not duplicate the text. The text should highlight the information presented in the table. Never present a table without referring to it in the text. Tables are placed after the reference list and there is no separate page for table

captions because tables do not have captions. Avoid using tables which are not necessary or which can be better done as figures. Shown below is a typical table in a journal manuscript.

Table 1

Phase 1 of Schedule 1

Trial	Key Color	Responses	Latency
1	red		4
2	red	3	6
3	green	1	21
4	red	6	8
5	green	2	30

Figures

The amount of behavior (e.g., the number of pecks) is almost always on the y (or vertical) axis, while the independent variable (experimental conditions) is on the x (or horizontal) axis. The way to use cumulative records is to Xerox them onto 8 ½ x 11 paper. The easiest way to make figures of other types is to Google "graph generator" and use whichever app you like. The figures (graphs) should be neat (use drawing software (e.g., Word) or if done by hand, a straight edge for drawing lines). Clearly label each part,

Each figure is presented on a separate page. Figures should be provided as the same size as they would appear in a journal. A figure caption should be printed below the figure. Figure captions should be concise, but complete enough to enable the reader to understand the figure without reference to the text. However, captions should not unnecessarily duplicate information in the text.

Figures are variables set into meaningful space. Typically, the horizontal axis is the independent variable and the vertical axis is the dependent variable.

A very productive plan for developing the perfect figure is to first make a very rough figure to illustrate what you want to say. Try to think through what you need to say in your paper and then what the figure means. Then consider if there is a even better illustration for the needed information. It may be that the original figure is the ideal format, but you may wish to present your data in a different format. Draw the figure you want neatly and elegantly. Stay within the same margins allowed for text pages. Be accurate. Figures are virtually always black and white. The most important points brought out in the figure must also be stated in the results section. Never include figures without referring to them in the manuscript text. Put the actual figures at the end of the paper.

Always go back over your figures:
    1. Be sure the horizontal axis is the independent variable. The vertical axis is the dependent variable.
    2. Be sure to label the x-axis and the y-axis

Bar Graphs

    A bar graph type of figure is for nominal data. As a rule of thumb, nominal data may be organized in any order along the x-axis. Nothing should change in what you said about the bar graph if you reordered the bars into some other order. Your statements about the bar graph should make as much sense whatever order the bars are presented in. In the following figure as it is, FR then VR then FI. However, the figure could have been drawn FI, FR, then VR; or any other order.
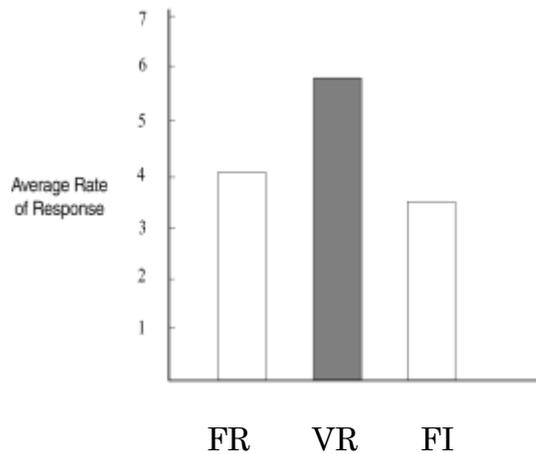
Line Graphs

    A point may be placed above each unit along the **x**-axis at the height of the variable for that category. In the following figure, it is the response rate in each consecutive minute. The information is ordered. You cannot switch things around on the x-axis. For example, the fourth minute follows the third minute and that data point cannot be plotted after the sixth minute. 1, 2, 3, 5, 6, 4, 7 makes no sense. If the points are in the center of each category a line can be drawn to connect them. The line then defines a frequency polygon. The frequency polygon implies quantities that would be appropriate for intermediate categories along the x-axis. For example, the height of the line half way between 5 and 6 is a good estimate of the response rate at 5 minutes, 30 seconds.

Line Graph or Frequency Polygon

Average Rate
of Response

Minutes
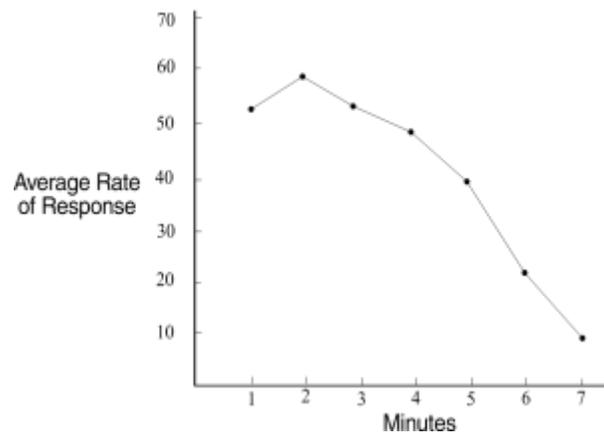
Summary: Lab Report Page Order

Look at the Lorem Ipsum version of a lab paper on the Bulletin Board in the lab room.

Title (first page)

Abstract (start on new page, centered on page but **not** in bold)

Introduction (Title) (start on new page, centered on page, but **not** in bold)

Method (word Method centered on page in bold)

Subjects (left margin in bold)

Apparatus (left margin in bold)

Procedure (left margin in bold)

Results (word Results centered on page in bold)

Discussion (word Discussion centered on page in bold)

References (start on new page **not** in bold)

Table(s) (start each on a new page)

Figure(s) and Caption(s) (start each on a new page)

Tips for Writing a Lab Report

Formatting
1. Turn off window (orphan) control to get rid of extra spacing at the bottom of the paper.
2. Turn off "add extra space between paragraphs" in the spacing settings to get rid of extra space in between paragraphs.
3. Although numbers 10 and above should be in numeral form, when starting a sentence ALL numbers should be spelled out.
4. Type the template word for word exactly as it is in the lab manual with your added fill in the blanks.
5. Print at 100% - neither larger nor smaller.

Title Page
1. Even though your entire paper is already formatted, you have to reformat the header. If you don't, the header and page number will be in the wrong font and size.

Abstract
1. Your abstract must be less than 150 words.

Method
1. The Procedure section needs to be detailed about how the experiment was conducted.
2. In the procedure section, avoid presenting your results. Most results should be saved for the results section.

Results
1. Every figure that is put in the paper should have a figure description in the Results section.
2. Figure descriptions should describe some data from that figure to connect to what the figure is showing.

Discussion
1. All work used from other sources than those given should also be put in APA style in the Reference section.
2. All references should be properly cited in the body of the lab report.
3. Don't have references that are not used in the lab report itself.

Figures
1. All figures should be properly labeled in the paper and legible.
2. All figures should be "zoomed in" so that they are visible.
3. For Lab Report 1, the first completed extinction schedule is Figure 1 because it is the last exposure to intermittent reinforcement. This is because you are supposed to give 10-20 reinforcers before starting extinction. your spontaneous recover graph is your Figure 2.
4. Figures go at the <u>end</u> of the lab report, not in the middle.

Lab Exercise 2
Submitting Your Lab Reports to the Canvas Plagiarism Checking Site

This exercise is due on ^^January 27 and is worth 25 points.

You are obligated to make Turnitin work and carry out this assignment. **If you know nothing whatsoever about computers, start working on this assignment early so that you can acquire the necessary skills.** Doing what is necessary for this course is extremely common sense so it should not be difficult at all, but it's a good idea to start early if you find this exercise daunting.

Find a computer with internet access. If you do not have one, there are several locations provided to students on campus, including many computer labs and the library. If you do not know how to do something, ask the assistant in the computer lab to help you with this assignment. If you are using a computer that is not the one you used to write the lab report make sure that you have the appropriate files on the cloud, a floppy disk, DVD, USB Memory Stick or other removable media and that both machines will read the file and be able to do what you need to it.

Go to the JSU homepage http://www.jsu.edu/. and click on the "I AM…" drop down box, click "current student". There is a quick link to canvas listed under the column "Quick links". Log onto Canvas by clicking on the "Canvas" tab on the JSU>Current Students page. A list of options will appear, select the Canvas link under "Quick Links". If you have never logged into Canvas you will need to follow the guidelines for first time users. To do this, click the link that reads "First time logging in?"

After you have logged onto Canvas you will see a page that displays all of your courses. Select Psychology 221 and it will bring up a page with a list of options. Click on "Assignments" and a list of the current assignments will appear. Select the appropriate assignment. For example, if you are submitting this exercise on submitting to the plagiarism site, you should select the assignment entitled, "Lab Exercise 2."

Select the "Lab Exercise 2", then select the "Submit Assignment" box. Select and attach the lab exercise in the same manner you would add an attachment to an email. When you click the Choose File link a box will appear. In the box, click browse and locate your file on the computer itself or your removable media device. Left click the appropriate lab report twice. Check the "I agree to the tool's End-User License Agreement. This assignment submission is my own, original work" checkbox. Click Submit Assignment.

Make sure that you use Microsoft Word to write your lab report or confirm that your application works with Turnitin. Other document programs will sometimes be problematic and Canvas may not recognize it. If you do not have Microsoft Word, make sure that you use a computer that does to write your paper. If you generated your report in something other than the current Word and you can get the current Microsoft Word to read the file you can save it as a current Microsoft Word file. But, do not depend on that option working. You must test it and get it to work before papers are due. You are responsible for submitting your lab report in a format that Turnitin will accept.

Additionally, you must use a browser that Canvas supports. If you cannot get onto Canvas, try a different browser.

Summary

1. Generate a text file of your own. (at least 25 words) on a computer using Microsoft Word. It must be original and something you wrote on your own and didn't just copy from someone else. Please do not plagiarize something to submit to the plagiarism test program. If you do, you will get an F for the semester for plagiarizing!

2. Store the file as a .DOC or an .RTF file. If you will not be using your own computer to log onto Canvas, store the text file on a removable storage media such as a flash drive that is compatible with your other computer.

3. Go to the computer you will be using to log onto Canvas if you will be using a different computer.

4. Log onto JSU's Canvas site.

5. Select Psychology 221 / 504.

6. Click on Assignments in the left-hand column.

7. Click on the "lab exercise 2" assignment.

8. Click view complete.

9. Insert your storage media.

10. Browse and go to your text file.

11. Double click on your text file to add it as an attachment.

12. **Check the "I agree to the tool's End-User License Agreement. This assignment submission is my own, original work" checkbox. Note: If you fail to do this, Turnitin does not accept your submission and you will fail to get credit for this exercise.**

13. Click Submit Assignment.

Recall that a single instance of plagiarism is sufficient grounds for you to be assigned an F for the entire course. Please do not cheat. We are all trying to do the best we can to help you earn an A, don't throw it away.

Do not cheat on the assignment that tests your submission for cheating. The purpose of Turnitin is to detect plagiarism and it will! You will flunk the course if you plagiarize on the test for plagiarism.

EXPERIMENT 1

Reinforcing and Extinguishing an Arbitrary Behavior

If you reinforce and extinguish an arbitrary behavior, you will prove to yourself that the consequence of a behavior affects its probability.

There are many things that will be accomplished in this lab. Each is very important in helping you develop the concrete skills you will need when trying to earn a living with your degree in psychology. In this lab you will learn how to deal with the behavior of a relatively simple organism, a pigeon. Without those skills, it will be unlikely that you will be able to deal with the more complex behavior of humans.

The unvarnished truth is that if you cannot learn to play a musical instrument, you should not plan on a career playing a musical instrument. If you cannot get a pigeon to peck a key, you should not plan on a career changing the behavior of humans.

To Overview What This Lab Will Give to You:

1. At a mundane level the first part of Experiment 1 allows the pigeon to get used to the experimental apparatus and extinguish any emotional behavior. This aspect of this exercise is important because it makes it easier to reinforce your selected behavior in the subsequent lab assignments. Simply put, it's hard to teach your pigeon much when it is frightened of the new environment.

2. The first part (Task 1) of Experiment 1 (the behavior log) also provides you with a good idea of what kinds of behavior typically occur in pigeons. This gives you a point of reference or "baseline" for the rest of the semester.
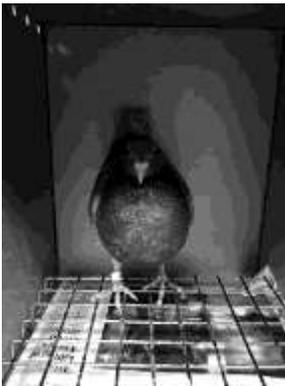
3. The second part of Experiment 1 (Task 2) establishes the sound of the operation of the food magazine as a learned reinforcer (magazine training). This second step is important because it enables you to deliver your reinforcer immediately rather than only after the bird "notices" it.

4. The third part of Experiment 1 (Task 3) also enables you to observe the effects of various environmental influences on the behavior of the pigeon especially, that a reinforcer such as food presentation will cause the pigeon to learn to do something.

5. The fourth part of Experiment 1 also establishes key pecking as a dominant behavior (Task 4) so you can study how more complex factors affect behavior in subsequent labs.

6. The final part of Experiment 1 allows you to observe extinction (Task 5), spontaneous recovery (Task 6), and the collateral effects of those procedures.

7. The experiment as a whole is designed to increase your awareness of behavior as **behavior** rather than as an <u>organism</u> doing things (the difference is the essence of radical behaviorism: it is "behavior per se" rather than "the mind as expressed by behavior." The subject of the sentence for Behavior Analysis is behavior not the organism doing something.

8. And finally, this lab experiment is to provide you with a catalyst for thinking about why behaviors are what they are and how they got that way.

Take home message demonstrated by this lab:

If a behavior is reinforced, it will occur. By inference, if behavior occurs, it was reinforced.

If your pigeon looked and acted exactly as it does but was actually a robotic machine designed to do things to educate students, you would be awestruck by the robot's amazing variety of complex behaviors and adaptive reactions to the environment. You would eventually notice how many of the behaviors were actually variations of simple basic behaviors. However, you would probably still be very curious about how a machine could possibly come to behave in such an "intelligent" way. More than likely, you would begin to systematically search for the things that were causing the machine to do specific things; you would "push the buttons and turn the knobs" of this machine; you would try changing things in the robot's environment to see what the robot did as the result of those events, and you would look for relationships between what you did and what you got. You would want to understand how and why your robot works and you would want to make your robot do things just as people often want to play with a new radio-controlled car or a new smart phone just to prove to themselves that they totally understand how it works.

To say that something is a machine is actually to say nothing more than: no magic is involved in its action; there is a reason for each behavior; the behavior has empirical causes; what occurs is understandable; and the behavior makes sense.

Your pigeon **is** a machine or a robot, it has no magic.

Experiment 1 Timeline / Overview

There are six basic procedures or tasks in this lab exercise. If you get overwhelmed in the next few pages, return to this overview to stay oriented with what you will be doing. The procedures could take you more or less time than other lab groups. The provided timelines are the times by which all but a very very few students finish each procedure working two days per week. Some students are faster and some are slower. Proceed at your own pace, but be sure to finish on time. **If you need more work with your pigeon, be sure to start**

coming in extra days soon enough to get your experiment in on time. **Don't wait until the last minute to try to catch up.** If you obtain the criterion behavior sooner than indicated on the timeline, by all means proceed onto the next task if that's what you would like to do (as soon as you have the quality of your pigeon's behavior approved by the lab assistant).

Session 1: Observation of adaptation (behavior log) (Task 1) / then magazine training (Task 2), and key peck shaping (Task 3) / then CRF stability
Session 2: VR training (Task 4)
Session 3: Magazine training due / VR strengthening
Session 4: VR stability
Session 5: Key pecking due / VR Stability / then Extinction (Task 5)
Session 6: (Task 6) Spontaneous recovery / then Experiment 2

Magazine training completion is due ^^ January 29.

Key peck training completion is due ^^February 3.

Write-up of Lab Report 1 (both written and electronic to Turnitin) due at the beginning of the lab period on ^^February 5.

I. Task 1: Observation of Adaptation

Introduction

Observation of adaptation to the experimental chamber (behavior log). This procedure allows you to observe the behavior changes taking place while your subject adapts to the experimental chamber, and prepares the bird for the subsequent experimental procedures.

This part of the lab is done during the first 15 minutes of the first session.

Apparatus Preparation
1. Tear out Behavior Logging Sheet located at the end of this lab.
2. Fill in the first section of your daily data sheet
3. Assure that the food magazine is not clogged with pellet dust.
4. Assure that the food hopper is full, fill it with strained pellets if necessary.
5. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
6. Select the schedule **Simple K1 Dark** by repeatedly pressing **Schedule Select.**
7. Turn the cumulative recorder paper drive switch on (up).
8. Carefully remove the pen caps and place them into the container.
9. Get your pigeon, weigh it (don't forget to tare the scale).
10. Fill in the second section of your daily data sheet.
11. Put pigeon into chamber and press **Start**.
12. Assure that the little green light is **off** – press **S* Mode** if necessary.

Procedure: *Getting the Bird to "Be at Ease" in the Chamber*

Maintain quiet surroundings. Pretend that the bird is a wild bird standing on an open table. Don't do anything that would scare it into flying away. It can't fly away, of course, but it will not be learning what you want if it is scared. Use the Behavior Logging Sheet to record your observations. Pay close attention to the pigeon's behavior. What behavior is generated in the new environment, especially as the result of unusual or transient stimuli? (Do not tap on the chamber or otherwise try to "get the pigeon's attention.") Continue your observation for 10 minutes. The trial time in the LCD display window of the control computer will be 600 (i.e., 600 seconds or 10 minutes). Use your data sheet to document how the behavior changed over that time period.

Recall that you may not have your cell phone out for any reason whatsoever.

Criterion to Proceed

* Proceed to next step after observing adaptation for 10 minutes

II. Task 2: Magazine Training

This procedure establishes a controllable reinforcer by teaching the bird to quickly eat from the feeder each time the feeder is raised. It can be broken into two stages for convenience in explaining the procedure.

    a.   getting the bird to eat from the feeder

    b.   getting the bird to go immediately to the feeder when it is raised

Magazine Training Part 1: Eat from the Feeder

Ten minutes into your first session, begin magazine training. The purpose of this procedure is to train the pigeon to eat from the food magazine. This is an important skill for you to acquire. If you cannot attain this performance criterion by ^^**January 29, 2020**, this behavior will be established for you but you will forfeit the opportunity of earning the 10 points available for establishing this behavior.

Apparatus Preparation

This task begins 10 minutes into Session 1.

1. Press the **S* Mode** button so that you are in the Immediate Reinforcement mode (the little green light goes **on**).

If you are at the start of Session 2 (or additional sessions):

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple K1 Dark** by repeatedly pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps and place them into the container.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **on** – press **S* Mode** if necessary.

Procedure. *Getting the Bird to Eat From the Feeder*

Using the reinforcer button, hold the food magazine in the up position by pressing the button every 2 seconds before the magazine has a chance to drop down. For the first time only, drop enough food into the top of the food aperture where the magazine light is to enable the pigeon to see food piled up inside the food aperture. Hold the hopper up by pressing the reinforcer button every 2 seconds until the bird eats for about 5 seconds, then stop pressing the reinforcement button and the magazine will drop after 3 seconds. Any food

remaining in the food aperture will probably spill out – that's OK. When your pigeon eats from the food magazine, go immediately to the procedure for Part 2B on the next page.

If your pigeon does not eat from the feeder during the first hour, don't worry, but plan to come in every day until the pigeon is magazine trained. You will need to practice your skills of unobtrusively teaching the pigeon to eat from the food magazine. It may take a while for some people to get their birds to eat for the first time, so keep at it! If necessary, drop a few grains of food into the top of the food aperture again. If you remain still and unobtrusive and quiet, then the bird will more quickly relax enough to eat. (Imagine how much you would be interested in eating if you were in a new and scary haunted house with Jason and Freddie hovering over your and making stabbing motions toward you.

Record your total session duration and number of reinforcers from your data display at the end of each session onto your daily data sheet. If after additional sessions, the pigeon still does not eat from the magazine, the lab assistant will magazine train the pigeon for you but you will not get the points available for magazine training your pigeon by yourself, so try as hard as you can. Your success in any future job in psychology will depend on your ability to control your subject's behavior.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* Proceed to Part 2B after the bird eats from the food aperture

Magazine Training Part 2:
Quickly Approach the Feeder

In this portion of the magazine training task, you are to train the pigeon to quickly approach the feeder from any place in the chamber and while doing any behavior.

Apparatus Preparation

If you do this procedure during the first session immediately after magazine training, there is no change in the apparatus.

If you are at the start of a session:

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple K1 Dark** by repeatedly pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **on** – press **S* Mode** if necessary.

Procedure *Getting the Bird to Eat When the Magazine is Operated*

Use the reinforcer button to present the magazine again 1 to 3 seconds after the bird eats for the first time. While the magazine is raised, press the button every 2 seconds to hold the food magazine up until the pigeon approaches the magazine. As before, allow the bird to eat 1-2 seconds before stopping the pressing every 2 seconds. The magazine will drop after 3 more seconds. Repeat this procedure until the bird has eaten from the magazine on three occasions. Thereafter, use a single press on the reinforcer button to present the food magazine for 3 seconds at random times. (Wait a variable amount of time averaging about 30 seconds between presentations.) **It is important to space out the food presentations and <u>not</u> reinforce any one particular**

behavior. This bears repeating: be sure not to simply keep the food magazine in the operated position. You must have periods of 'No Food' availability and you must not reinforce the same behavior more than once. (Note that standing still is a behavior. **Do not teach the bird to stand still by operating the food magazine over and over when the bird is standing still**). Present the magazine sometimes when the bird is facing the back, sometimes facing the front, bobbing its head, turning, etc. By the time the bird eats from the magazine 10 times, the pigeon should be quickly approaching the magazine from any part of the chamber as soon as you operate the magazine.

If the bird is slow to go to the magazine and fails to get any food when you operate the magazine, operate the magazine so that the food magazine stays operated by pressing the reinforcement button every 2 seconds. Once the pigeon starts to regularly eat from the magazine, stop pressing the button every 2 seconds and press it only once and again start building up the time the magazine remains down. You may need to continue the magazine training another session. Be especially careful not to reinforce the same behavior over and over. This portion of the training is complete when the bird is doing a variety of things between food presentations but responds <u>quickly</u> to the magazine sound and light, regardless of what it is doing. If you fail to establish a quick approach to the magazine as soon as it is operated, then it will be very much more difficult to shape key pecking as required in the next step of this lab project.

Recall that the bird can eat only so much in a day. As you provide more food presentations, you will notice the bird going to eat more slowly. This will probably begin after about 20-50 eating episodes, depending on the size of your bird. It's most productive to terminate the session when the bird begins to satiate. At that point, food is no longer functioning as a meaningful reinforcer and you will accomplish little or nothing. Besides, if you provide too many reinforcers on a day, then the next day your pigeon will be overweight.

Record your total session duration and number of reinforcers from your data display at the end of the session.

Again, if you are unable to magazine train your pigeon, the lab assistant will do it for you, but you will lose points from your final grade, so try as hard as you can, by coming in every day until you get the desired behavior.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.

6. Turn cumulative recorder paper drive switch off (down).

7. Lift the tension roller, pull out, and tear off record. Do not lift pens.

8. Carefully replace pen caps.

9. Clean bottom of chamber and replace newspaper.

10. Refill the food hopper with strained pellets.

11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* 1. *When you establish the pigeon doing a variety of things between reinforcers but eating quickly from a raised magazine, have the lab assistant observe that behavior and then initial your Data Sheet so that you can proceed to the next step. The criterion behavior should occur as   early as the first or second day you run your pigeon.*

* 2. *Proceed to the next step after the lab assistant initials your Data Sheet and approves the change.*

III. Task 3: Reinforcing an Arbitrary Behavior

Introduction

In this phase, you will be teaching a living organism to do something it has never done before. You will establish key pecking as the dominant behavior in a pigeon. Most pigeons, of course, have a long past history of pecking the ground for grain but have not pecked a vertical surface that has no grain on it (such as the key) The baseline level of key pecking is therefore zero. It will be your job to create key pecking as a behavior in your pigeon.

It is essential to realize that this key pecking behavior is arbitrary. You could just as easily reinforce eye blinks, jumping, or cooing. There are two ramifications to realizing that the behavior you choose is arbitrary:

1. The reason for choosing a key peck is that the Control Computer can count the pecks for you and can automatically keep track of how many there were. This makes your life easier. If what the bird does doesn't matter, why choose something like eye blinks which would be very difficult for you to see, and which would require that you keep a tally with pencil and paper. You might as well choose something that helps you and makes your task easier. If a magic genie said you could have 10 pounds of anything you wanted, you might as well choose gold or diamonds instead of water or dirt.

2. You are teaching a pigeon to peck a key **as an example**. Knowing how to shape a key peck enables you to easily teach a child to read, a criminal to go straight, a senile person to remember to turn off the stove, a sad person to be happy, or a horse to jump.

Reinforcing Behavior Part 1: Shaping a Key Peck

In this Part 1 of Task III, you are to shape a key peck. This is a critical skill for you to acquire. It is essential for you to learn how to create a behavior or change a behavior in a living organism. Your career will depend on it. If you cannot attain this performance criterion by ^^**February 3, 2020**, this behavior will be established for you, but you will forfeit the opportunity of earning the 90 points available for establishing this behavior on your own.

Apparatus Preparation

If this task begins in the middle of a session:

1. Press **Stop/Clear** once
2. Record onto your daily data sheet:

    Total session duration up to that time

    Number of reinforcers (trials) up to that time
3. Press **Stop/Clear** again (at least 5 seconds later) to clear the data and reset the computer
4. Press the **Schedule Select** button until **Simple Schedule Key 1 Red** appears on the display.
5. Press **Start Button** to start the key peck shaping portion of the session.
6. Press the **S* Mode** button until the small green light goes **on** (the immediate reinforcement mode).

If you are at the beginning of a session

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple Schedule Key 1 Red** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **on** – press **S* Mode** if necessary.

Procedure.   *Shaping a Key Peck*

Place the bird in the chamber and begin by operating the magazine when the pigeon is facing the panel with the key on it (reinforce that behavior). When the head is typically facing the panel, begin reinforcing head movements in the direction of the key at your first opportunity. Gradually require that the pigeon move its beak closer and closer to the key. If at any time you get a very big step toward your desired behavior from the pigeon, even if it is not in the order you expected, be sure to immediately reinforce it, but be satisfied with small steps if that is all you are getting. For example, if you get a pecking motion toward the key but it is still a good distance away, reinforce that and then try moving the peck closer to the key. Be careful at this point not to reinforce improper versions of the behavior too much, such as multiple reinforcers for pecking the floor or for sideways swinging movement of the head in front of the key or pecks that just miss to one side of the key. The more you reinforce the same imperfect behavior, the more difficult it will be to move the behavior on to the next step. Even after the pigeon pecks the key for the first time, you may still need to continue shaping as the performance is initially very weak.

Be careful not to simply press the reinforcement button regardless of what the bird is doing (e.g., standing still or moving away from the key). You can neither require too much of a behavior change nor too little of a behavior change. You must stay very focused on the behavior of your pigeon and you must constantly be thinking about what to require next.

Whether or not the bird has learned to peck, stop the session when the bird only slowly approaches the magazine, i.e., after about 20-50 reinforcer presentations.

The first critical factor to understand in order to make shaping a key peck easy is that whatever behavior is immediately followed by a reinforcer will be repeated. This bears repeating: **reinforcers must be immediate**. If the hopper operates as the bird is pecking the key, you will reinforce that behavior. If the bird is pulling back from pecking the key or moving down to look in the hopper after pecking before you get around to push the button then you will reinforce pulling back or looking down. You must reinforce the key peck and not what the bird does the instant before or after the key peck.

Your task is like that of a photographer trying to capture some very particular behavior out of a fast moving series of behaviors. Another example of how critical your timing is, is baseball. You must swing the bat at the instant that it will connect with the ball. You cannot swing a split second too soon nor a split second too late. You must be exactly on time or you will strike out. If you are very intent on the behavior of your bird and very fast at pushing the reinforcer button you will capture the right behavior and shape a key peck very quickly. You must be like a batter who is paying extreme attention to every little detail of the behavior of the pitcher, trying to predict exactly what will happen next. If you pay very close attention to every little detail of your pigeon's behavior, you will be able to

push the button at exactly the right time most of the time. On the other hand, like a batter whose mind is wandering, if you are not maintaining focus throughout the lab period or talking to your lab partner, you cannot expect to do well.

However, **DO NOT use excessive force when operating the push-buttons**. It will startle the bird, cause the switch to "misfire," reinforce the wrong behavior, and will likely break the switch. A simple speedy depression of the button is ideal.

The second critical factor to understand in order to make shaping a key peck easy is the process of successive approximations to the desired behavior.

Don't ask too much. Just as any long journey is actually a series of small steps, so establishing a behavior is simply a series of small steps. If you wanted someone to run 26 miles, it's not a good idea to demand that entire performance on the first day. First have the person run as far as they can. Then after an adequate rest, have the person run a bit further, each time requiring a bit more, but always keeping the increment attainable.

A very important aspect of quickly shaping the behavior you desire is therefore to be able to notice when even very small changes in behavior occur that are in the direction that you want. You should try to pay the closest possible attention to your pigeon so that you notice any progress and can therefore reinforce it instantly.

For example,

1. reinforce the bird for moving,
2. then reinforce the bird for looking at the side of the chamber with the key,
3. then require a look toward the key,
4. then a small movement toward the key,
5. then a larger movement toward the key,
6. then a pecking motion at the key,
7. then a key peck.

Know what your goal is: a key peck. **Anytime the bird does anything that moves it in the direction of your goal, reinforce it!** Any time you can jump ahead in the list, do it. Be prepared to take advantage of any shortcut the bird gives you.

Alternatively, be prepared to take a slightly different path toward the same goal. If your bird makes slight pecking movements before looking at the key, then reinforcing pecking, then move the direction of the pecking toward the key by reinforcing only pecks that are directed toward the key.

Don't ask too little. You cannot ask for too much, but on the other hand, you cannot ask for too little. If for the first month you ask your athlete to run ten steps, then the second month, you ask for eleven steps, your athlete would never reach their goal of being a marathon runner. Similarly, a problem occurs when the pigeon is reinforced several times for simply standing still in the experimental chamber. This can easily occur when an experimenter hopes to "bribe" the pigeon by giving it food for nothing. Unfortunately, rather than the pigeon reading the mind of the experimenter and rushing over to peck the key in gratitude, the pigeon does what it was doing when it was reinforced: it stands motionless in the chamber.

There are no stupid birds. Your bird's speed of acquisition is dependent on your ability to correctly provide reinforcers at the appropriate times, following the appropriate behaviors, rather than at the wrong times or for the wrong behaviors. There is no such thing as stupid baseballs – there are only batters that pay attention and try very hard and batters whose attention is somewhere else or who aren't really trying (and therefore strike out!).

In sum:
1. Very carefully watch every tiny detail of your pigeon's behavior.
2. Stay alert and right on the edge of responding with a hair trigger. You cannot allow your attention to drift for even an instant. You certainly cannot be carrying on a conversation with your lab partner.
3. If the behavior is more like your goal, reinforce it instantly.
4. If the behavior is not more like your goal, don't reinforce it.
5. Don't demand too much. If you asked too much and the bird's behavior regresses, don't hesitate to reinforce a less than ideal behavior.
6. Don't demand too little. If you asked too little and the behavior stagnates, then up the requirement. A common mistake is to reinforced standing still.
7. When the pigeon begins to delay before it eats from the magazine or eats slowly, stop for that day.

Establishing key peck behavior may take one or several sessions, depending on your skill. If you are having difficulty, recall how important this skill is to your success in the practice of psychology. Your whole career will be centered around changing the behavior of your patients. If necessary, run your bird 5 days per week so that you can gain this absolutely essential skill. If you cannot shape a simple animal to do a simple behavior, how can you expect to shape a human to do complex behavior such as giving up crime or acting "normal" or feeling happy. Your employment success depends on your skill of changing behavior. Just as physicians must reliably change the health of their patients, so psychologists must reliably change the behavior of their patients.

If you are having difficulty shaping your pigeon and you are falling behind the rest of the class, be sure to come in extra days to acquire this essential skill. Talk to the lab assistant about your situation. If you cannot shape your pigeon, the lab assistant will shape it for you, but you **will lose an entire letter grade** so try as hard as you can and come in as much as is necessary. This particular skill is essential for your success in the field of psychology.

Record your final data from your data display at the end of the session.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* *Proceed to next step when the pigeon reliably pecks the key within 10 seconds of eating*

Reinforcing Behavior Part 2: Stabilize Key Peck

In Part 2 of Task III, you are to stabilize the key peck you just shaped.

Apparatus Preparation

If this task begins in the middle of a session:
1. Press **S* Mode** until the little green light is **off**.

If you are at the beginning of a session
1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple K1 Red** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* Mode** if necessary.

Note!! From this point forward, whenever you are running your pigeon, the little green light should be off until you press the **S* Activate** button. When you press the **S* Activate** button the little green light should flash. **The reinforcement magazine must not operate unless the pigeon is pecking.**

This bears repeating. When you press S* Activate nothing will happen except the little green light will flash (that means that the key is armed). **The bird must peck the key for the hopper to operate**. In this way, the computer will immediately reinforce a key peck which will relieve you from trying to time when to push the button. But note that this will only work when the bird is well shaped already. This will be the way things work from now on:
1. You press **S* Activate**
2. Little green light flashes
3. You wait
4. Pigeon pecks
5. Reinforcement magazine operates

6. The computer assures that you reinforced a key peck and not something else,
7. You must press S* Activate each time you want the next peck to be reinforced.

Procedure: *Stabilize Key Peck: Continuous Reinforcement Schedule*

The schedule used in this procedure reinforces only when a peck occurs and reinforces every peck. This schedule is labeled **continuous reinforcement**, or **CRF**, because each peck produces a reinforcer presentation.

In this phase, allow the key peck behavior to strengthen as the result of its intrinsic contingency "the sooner the peck, the sooner the food."

Press the "Arm Response Key" (the bottom button) immediately after you press the start button. The little green light beside the button will flash indicating that the next key peck will be reinforced. During reinforcement, press the button again. In this way, every key peck (and only key pecks) will be reinforced. This arming the key procedure guarantees that the key peck will be reinforced the instant it happens.

When the bird only slowly approaches the food magazine when it is operated (after about 20-50 reinforcers in a single session), quit for the day. The bird is satiated and food will no longer function as an adequate reinforcer. Record your final data from your data display at the end of the session.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* *Proceed to next step after approximately 10 CRF reinforcers are delivered.*

IV. Task 4: Strengthen Behavior With Intermittent Reinforcement

In this task, you are to strengthen key pecking by intermittently reinforcing it. Your task is to try to establish a VR5 schedule of reinforcement by reinforcing after a number of pecks which can vary from 1 to 10 pecks. Reinforcement occurs after 1 or 2 or 3 pecks, more often than after 8 or 9 or 10 pecks so that there is a strong tendency to peck right after a reinforcer is over.

Apparatus Preparation.

If you are continuing a session, there is no apparatus change.

If you are at the beginning of a session:

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple K1 Red** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* mode** if necessary.

Procedure: Establishing Strong Responding: Variable Ratio Schedule

The goal of this task is to establish strong consistent pecking in your pigeon. In order to do that, you will build up to a variable ratio 5 schedule (VR5). A variable ratio 5 schedule sometimes pays off after a single peck and sometimes pays off after any number between 1 and 10 pecks. The requirement is unpredictable and changes after every reinforcer. For example:

peck peck peck REIN

peck REIN

peck peck peck peck peck peck peck peck peck peck REIN

peck peck peck REIN

Etc.

The schedule works like a one-armed bandit (always changing, only averaging 5 pecks, sometimes requiring more and sometimes less but always unpredictable. It does not simply increase 1 then 2 then 3, etc. nor simply decrease 10 then 9 then 8 etc.

In order to get a VR5 performance, you will need to shape it. The way to do that is to first require a single peck for a few reinforcers; then reinforce either one or two pecks. When that is going well, increase to reinforcing either 1, or 2, or 3, then 1, or 2, or 3, or 4 … etc. Always remembering that on any particular run it could pay off after just 1 peck. Eventually you will be able to get strong responding for any requirement between 1 and 10. The important thing to remember is that at first the pigeon will get reinforced for sometimes 1, sometimes 2, sometimes 3 pecks. Later it is sometimes 1, sometimes 2, sometimes 3, sometimes 4, and sometimes 5 pecks. The shaping procedure keeps occasionally reinforcing after only 1 peck but keeps occasionally requiring more and more pecks. Most often the payoff is for only a few, but often enough it stretches out to 10 pecks. As long as the pecking is strong, you can increase the upper end of your set of requirements by a peck or two. If behavior weakens, then provide reinforcers more often for only a few pecks.

A trick you can use is to very diligently watch your pigeon pecking. If it pecks, pauses, pecks; (for example peck ….. peck ….. peck ….. peck) then slowly increase the upper end of the number of pecks you require for each reinforcer. If the pigeon at any time pecks twice in a row quickly (a burst), then immediately reinforce the second or third or fourth quick pecks in a row. For example:

<div align="center">peck ….. peck ….. peck peck REIN</div>

It is extremely important that you carefully watch for bursts of pecking and IMMEDIATELY reinforce them. In this case, not only are you reinforcing after 4 pecks but also reinforcing 2 pecks in quick succession. Soon the pigeon will be pecking 3 or 4 in a row in quick succession because pecks in quick succession are reinforced.

You will require, <u>on average</u>, successively more pecks for each reinforcer but always go back to just one. This is an intermittent reinforcement schedule, and it makes responding more robust. The point of this procedure is to shape a run of responses by first reinforcing the first peck in a series and then sliding the upper end of the requirement up. Occasionally require 1 peck or 2 pecks for each reinforcer. By pressing the **S* Activate** button during reinforcement or following 1 or 2 pecks, respectively (the little green light will flash after you press this button). Every so often require more than 2 pecks. Wait for 3 or 4 or 5 pecks before pressing **S* Activate.** The specific requirement must randomly change. **You are NOT simply increasing the work requirement up to 5 pecks, but rather you are providing a reinforcer after 9, 1, 7, or 2 pecks in <u>random order</u>.** There must be a roughly equal chance of food following any amount of pecking -- sometimes right away, sometimes after some pecking, sometimes only after a lot

of pecking. Just as a slot machine must pay off after only one pull sometimes and only after many pulls at other times.

It is critical to understand that you are establishing the stimulus condition for when a peck is followed by food. Sometimes a peck immediately after food "pays off." Sometimes a peck after 4 or even 9 preceding pecks "pays off." Therefore, the stimulus for "the next peck will be reinforced" is either 1, 0, 4, or 9 previous pecks. As a result, there will be a very high tendency to peck after eating and after 1, 2, 3, or 9 pecks.

Diligently try to reinforce two or more very closely spaced pecks whenever they occur. **If the bird is very rapidly pecking, press the S* Activate button before the bird stops the burst of pecking so that you can immediately reinforce very closely spaced pecks no matter when they occur.** When you do that you are establishing "having just pecked an instant ago" as a stimulus that signals that the next peck can be reinforced. As a result, the bird will peck when that condition recurs. This results in pecking at a high, sustained rate. Do not be too stringent about demanding this strengthening procedure, reinforcer after every peck or after only a few if behavior is weak.

You are establishing two signals that the next peck may be reinforced

1.   having just pecked an instant ago
2.   having pecked 0, or 1, or 2, or 3, or …. 9 times.

This procedure of Task IV will typically be carried out during Sessions 4 and 5 and the first half of Session 6.

Be sure to quit for the day when the bird only slowly <u>eats</u> because food is losing its power to reinforce that session.

Record the data from your data display at the end of the session.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* 1. *After you have obtained fast, consistent responding between the previous reinforcement and the reinforced response, have the lab assistant initial your data sheet.*

* 2. *Proceed to next step at your first opportunity that is in the <u>middle of a session</u>:*
        a. *after the pigeon has received only 10-20 reinforcers in that session and*
        b. *you have time to run the bird for more than 30 more minutes.*

* 3. *At the end of Task IV, which will occur in the middle of a session, note and write down the total session time and count before you proceed to the next procedure (extinction).*

Performance to be Expected Before Proceeding: Acquisition (VR 3)
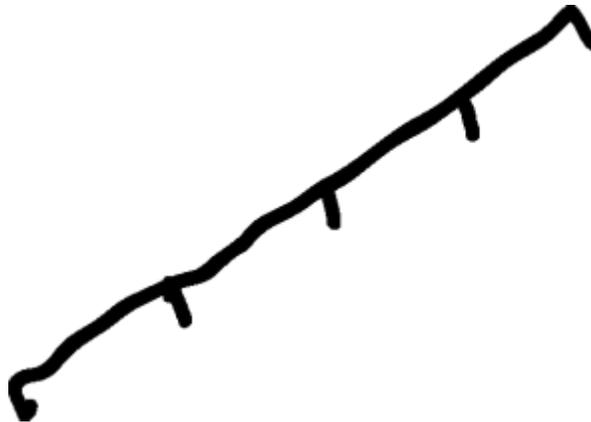
Student: Session
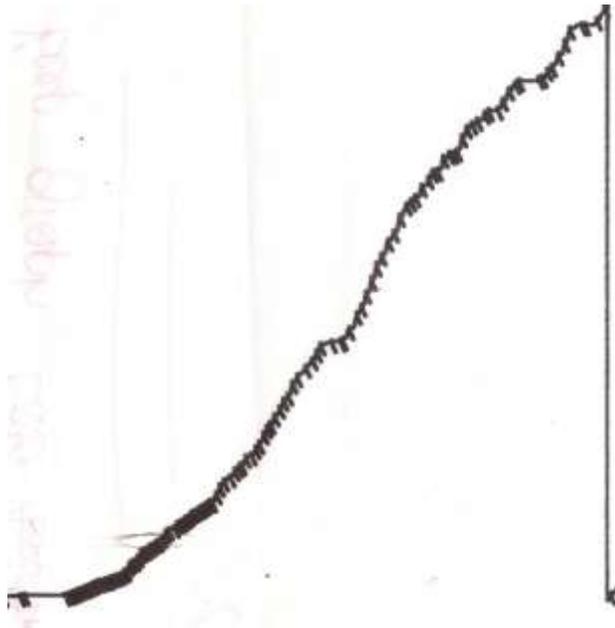
Student: Local

V. Task 5: Extinguish a Previously Maintained Operant

In this task you are to observe the extinction of a formerly reinforced operant. When reinforced responding is no longer reinforced, it weakens and eventually ceases to occur. The procedure is labeled extinction and the behavioral result (i.e., no responding) is labeled extinction of the operant.

Apparatus Preparation.
This is the continuation of the previous session (typically Session 6), and there are no apparatus changes.

Use the Extinction Response Logging sheet at the end of this lab to record the number of pecks made during each minute of the extinction portion of the session.

Procedure: *Extinguish Key Pecking*
The purpose of this procedure is to observe the decrease in key pecking behavior that results when that behavior is no longer reinforced. Also it is to give you an opportunity to note: 1) emotional behaviors such as wing-flapping, "trying to escape," etc., and, 2) the shape of the cumulative record when a previously reinforced behavior is no longer reinforced. In your professional career, you will often have to deal with the results of an extinction schedule.

No reinforcers are to be given during this procedure. Record the cumulative number of responses at the end of each minute during this procedure. When the trial time is 60 seconds greater than the previous time. write down the trial count onto your Extinction Response Logging Sheet.

- When your controller window total session time equals 60 seconds, write down the total session count on you Extinction Response Logging Sheet.
- When your controller window total session time equals 120 seconds, write down the total session count on your Extinction Response Logging Sheet
- Repeat this process every 60 seconds until the total session time is 3000 seconds.

Remove the bird at the end of the session or when **10 consecutive minutes elapse without a single peck.**

Record your final data from your data display at the end of the session before pressing the stop/clear button. Because no reinforcers occurred, no data will be displayed in the window after pressing the stop button.

If the pigeon is still occasionally pecking at the end of the session, carry out another extinction session the next day. Terminate the session after you obtain 10 minutes without a single peck.

Criterion to Proceed

* _After you have obtained 10 minutes without a peck_, have the lab assistant observe the behavior of your pigeon and cumulative record and initial your data sheet before you terminate the session and remove the bird.

* Proceed to the next procedure only at the _beginning_ of the next session. The second part of the next session will be Experiment 2, so be sure to read how to do Experiment 2 now before you start the next session.

VI. Task 6: Observation of Spontaneous Recovery

In this task you are to observe the spontaneous recovery of an extinguished operant. When an organism is placed into a situation where a formerly reinforced operant was extinguished, the formerly reinforced behavior recurs. This shows that extinction is not as simple as water draining out of a sink. If what was learned (such as key pecking) simply disappeared like water draining out of a sink or then it couldn't come back because "it" would be gone. Whatever learning is, it is semi-permanent because it does not simply and totally disappear when you stop reinforcing it, even if it sopts occurring.

Apparatus Preparation
1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple K1 Red** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* mode** if necessary.

Procedure: *Documentation of Spontaneous Recovery*
Continue the extinction procedure for the first 15 minutes (900 sec) of this session, in order to observe the reemergence of the previously reinforced behavior when the organism has been removed from the situation and subsequently returned.

Keep a record of the number of pecks in each minute of this portion of the session on the Spontaneous Recovery Response Logging sheet just as you had during the last half of the previous session. Also note any emotional behavior to the side of the minute it occurred.

Carry out the spontaneous recovery test until the trial time equals 900 seconds (15 minutes).

Record your data from your data display at the end of this portion of the session.

Performance to be Expected: Spontaneous Recovery
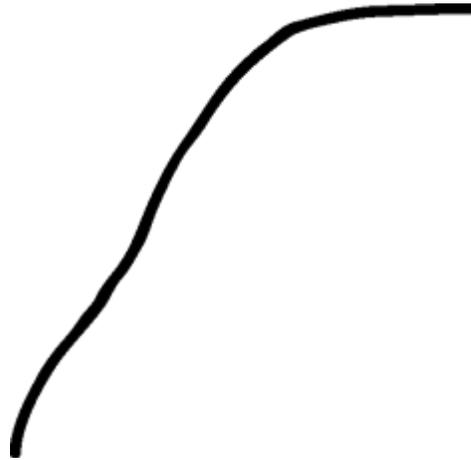
Student: Spontaneous Recovery and Experiment 2 Session
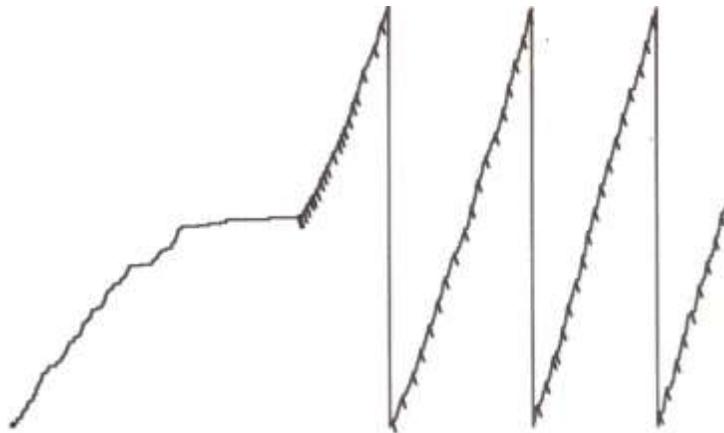
Criterion to Proceed

* Proceed to the next procedure (Experiment 2) when you have collected 15 minutes (900 seconds) of data.

Note that you will be starting the next lab assignment 15 minutes through this session. Be sure to read the next lab in advance so you are prepared to carry out the procedures called for.

Data/Programming Sheets

Student ID _____   Section _____
Date _____

Behavior Logging Sheet

Minute	Behaviors
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Student ID _____ Section _____

Date _____

Extinction Response Logging Sheet 1

Minute Number	Number of Responses		Minute Number	Number of Responses
1 (60 sec)	_____		26 (1560 sec)	_____
2 (120 sec)	_____		27 (1620 sec)	_____
3 (180 sec)	_____		28 (1680 sec)	_____
4 (240 sec)	_____		29 (1740 sec)	_____
5 (300 sec)	_____		30 (1800 sec)	_____
6 (360 sec)	_____		31 (1860 sec)	_____
7 (420 sec)	_____		32 (1920 sec)	_____
8 (480 sec)	_____		33 (1980 sec)	_____
9 (540 sec)	_____		34 (2040 sec)	_____
10 (600 sec)	_____		35 (2100 sec)	_____
11 (660 sec)	_____		36 (2160 sec)	_____
12 (720 sec)	_____		37 (2220 sec)	_____
13 (780 sec)	_____		38 (2280 sec)	_____
14 (840 sec)	_____		39 (2340 sec)	_____
15 (900 sec)	_____		40 (2400 sec)	_____
16 (960 sec)	_____		41 (2460 sec)	_____
17 (1020 sec)	_____		42 (2520 sec)	_____
18 (1080 sec)	_____		43 (2580 sec)	_____
19 (1140 sec)	_____		44 (2640 sec)	_____
20 (1200 sec)	_____		45 (2700 sec)	_____
21 (1260 sec)	_____		46 (2760 sec)	_____
22 (1320 sec)	_____		47 (2820 sec)	_____
23 (1380 sec)	_____		48 (2880 sec)	_____
24 (1440 sec)	_____		49 (2940 sec)	_____
25 (1500 sec)	_____		50 (3000 sec)	_____

Student ID _____   Section _____

Date _____

Extinction Response Logging Sheet 2

Minute Number	Number of Responses		Minute Number	Number of Responses
1 (60 sec)	_____		26 (1560 sec)	_____
2 (120 sec)	_____		27 (1620 sec)	_____
3 (180 sec)	_____		28 (1680 sec)	_____
4 (240 sec)	_____		29 (1740 sec)	_____
5 (300 sec)	_____		30 (1800 sec)	_____
6 (360 sec)	_____		31 (1860 sec)	_____
7 (420 sec)	_____		32 (1920 sec)	_____
8 (480 sec)	_____		33 (1980 sec)	_____
9 (540 sec)	_____		34 (2040 sec)	_____
10 (600 sec)	_____		35 (2100 sec)	_____
11 (660 sec)	_____		36 (2160 sec)	_____
12 (720 sec)	_____		37 (2220 sec)	_____
13 (780 sec)	_____		38 (2280 sec)	_____
14 (840 sec)	_____		39 (2340 sec)	_____
15 (900 sec)	_____		40 (2400 sec)	_____
16 (960 sec)	_____		41 (2460 sec)	_____
17 (1020 sec)	_____		42 (2520 sec)	_____
18 (1080 sec)	_____		43 (2580 sec)	_____
19 (1140 sec)	_____		44 (2640 sec)	_____
20 (1200 sec)	_____		45 (2700 sec)	_____
21 (1260 sec)	_____		46 (2760 sec)	_____
22 (1320 sec)	_____		47 (2820 sec)	_____
23 (1380 sec)	_____		48 (2880 sec)	_____
24 (1440 sec)	_____		49 (2940 sec)	_____
25 (1500 sec)	_____		50 (3000 sec)	_____

Student ID _____ Section _____

Date _____

Extinction Response Logging Sheet 3

Minute Number	Number of Responses		Minute Number	Number of Responses
1 (60 sec)	_____		26 (1560 sec)	_____
2 (120 sec)	_____		27 (1620 sec)	_____
3 (180 sec)	_____		28 (1680 sec)	_____
4 (240 sec)	_____		29 (1740 sec)	_____
5 (300 sec)	_____		30 (1800 sec)	_____
6 (360 sec)	_____		31 (1860 sec)	_____
7 (420 sec)	_____		32 (1920 sec)	_____
8 (480 sec)	_____		33 (1980 sec)	_____
9 (540 sec)	_____		34 (2040 sec)	_____
10 (600 sec)	_____		35 (2100 sec)	_____
11 (660 sec)	_____		36 (2160 sec)	_____
12 (720 sec)	_____		37 (2220 sec)	_____
13 (780 sec)	_____		38 (2280 sec)	_____
14 (840 sec)	_____		39 (2340 sec)	_____
15 (900 sec)	_____		40 (2400 sec)	_____
16 (960 sec)	_____		41 (2460 sec)	_____
17 (1020 sec)	_____		42 (2520 sec)	_____
18 (1080 sec)	_____		43 (2580 sec)	_____
19 (1140 sec)	_____		44 (2640 sec)	_____
20 (1200 sec)	_____		45 (2700 sec)	_____
21 (1260 sec)	_____		46 (2760 sec)	_____
22 (1320 sec)	_____		47 (2820 sec)	_____
23 (1380 sec)	_____		48 (2880 sec)	_____
24 (1440 sec)	_____		49 (2940 sec)	_____
25 (1500 sec)	_____		50 (3000 sec)	_____

Student ID _____ Section _____

Date _____

Spontaneous Recovery Response Logging Sheet

Minute Number	Number of Responses
1 (60 sec)	_____
2 (120 sec)	_____
3 (180 sec)	_____
4 (240 sec)	_____
5 (300 sec)	_____
6 (360 sec)	_____
7 (420 sec)	_____
8 (480 sec)	_____
9 (540 sec)	_____
10 (600 sec)	_____
11 (660 sec)	_____
12 (720 sec)	_____
13 (780 sec)	_____
14 (840 sec)	_____
15 (900 sec)	_____

Writing Your Research Paper

The following sample paper is a template for your research paper.

You must fill in the blank spaces, write material on your own where indicated, then type, and print out your paper on your own. **It is important that you type for yourself the prewritten sections of your paper because it will provide you with a staged exposure to the final requirements of this course and therefore make the final requirement easier.** You are getting credit for typing your paper yourself.

Do not type the italics hints within parentheses after each sentence.

Do not share the typing responsibility. That is a form of plagiarism and will result in an F for the semester.

You may not work with anyone. Do not discuss your ideas or how you are going to write your paper with anyone. **You cannot use as an excuse for unusual similarities with someone else's paper that you talked to them about your paper.**

Refer to the "How to Write a Lab Report" section of this manual, or the lab assistants, for additional information on writing a lab report.

The Lab Reports must be typed, stapled, formatted correctly (including being typed double-space with a serif font such as Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point, and neat. You must include your actual cumulative records (or Xerox copies) stapled as a group to the back of the research paper.

Note that you use your student ID number rather than your name.

Observe the sample paper on the bulletin board of the lab to know how your paper should appear. You will lose points if our paper is not formatted correctly.

If you do not have a computer and/or a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you a day or so to learn how to type and print a paper. A second reason to start early is that you may experience a computer hardware problem that could cause your paper to be late.

Be sure to:
1. Double space and print on only one side of the paper.
2. Fill in all of the blanks in the template or sample paper.
3. Write material on your own where indicated. Do not simply retype the instructions. For example, when it asks for "your student ID number," type your student ID number and do not retype "your student ID number."
4. Submit your paper to the Canvas plagiarism site before the beginning of the lab on the day it is due.
5. Print the paper at 100%. Do not print it smaller or larger.
6. Hand your lab report directly to the lab assistant before the beginning of the lab on the day it is due.

For sample papers, go to:
APA's website
apastyle.org/manual/related/sample-experiment-paper-1.pdf
or
Purdue University's OWL website
https://owl.purdue.edu

DO NOT CHEAT. You will flunk the course!

You may not copy anyone else's paper (even the typed template from a previous lab or your own paper from a previous semester).

The Canvas Plagiarism Checker will discover you are cheating and you will receive an F for the semester for doing so.

HAND REPORT DIRECTLY TO LAB ASSISTANT

You cannot use as an excuse that you gave it to someone at the Walmart who said they would turn it in for you.

The Effect of a Behavior's Consequence on its Probability

_____

(your student ID number)

_____

(your lab section and time)

Jacksonville State University

Abstract

The effect of reinforcement on the behavior of an organism was demonstrated. A shaping procedure was used to condition a key peck in a pigeon. Pecking was the dominant behavior following the delivery of _____ (*number of*) reinforcers. This procedure took approximately _____ (*how many*) minutes spread over _____ (*how many*) sessions. Following further strengthening, key pecking was then extinguished. Under the Extinction schedule, approximately _____ (*how many*) responses occurred before _____ (*how many*) minutes of no responding. On the following session, another extinction procedure was carried out to observe any spontaneous recovery. _____ (*how many*) responses occurred before _____ (*how many*) minutes of no responses in this first spontaneous recovery session. The findings were taken as support for the view that reinforcement is a critical variable in the control of behavior, and that extinction does not simply undo whatever was learned.

Keywords: reinforcement, extinction, pigeon

The Effect of a Behavior's Consequence on its Probability

Skinner (1938) found that the immediate presentation of food to a hungry animal following a specific behavior _____ the frequency of that behavior (*what happens to the frequency?*). Additionally, he found that reinforcing successive approximations to some specific behavior dramatically _____ the time with it took to acquire that behavior (*what happens to the time it took?*).

The present experiment was a systematic extension of his shaping procedure. In the present case, pecking a small round disk, or key, was chosen as the _____ (*behavior that can be observed*) in a pigeon. Food presentation was chosen as the _____ (*what increased the rate of the behavior*).

Further, the present research assessed the importance of the reinforcement contingency by removing food presentation. It was hypothesized that the results would be similar to those of Skinner. The behavior was expected to _____ (*increase or decrease*) during the conditioning phase and _____ (*increase or decrease*) to near a baseline level of responding during and following extinction phase.

Finally a second extinction session was implemented in order to provide an opportunity for _____ _____ to occur (*a once extinguished behavior that recurs*). The presence of _____ _____ (*a once extinguished behavior that recurs*) has important implications with respect to the nature of learning.

> (Note that the Method section doesn't necessarily begin on a new page.)

Method

Subject

One experimentally naïve pigeon weighing approximately _____ (*how many*) grams was used. The pigeon was housed individually in an animal colony and was maintained at _____ (*how much*) percent of its free feeding weight. Water was freely available in the home cage.

Apparatus

A standard operant conditioning chamber with three aluminum sides and top, with a Plexiglas front was used in this experiment. The internal dimensions were _____ cm wide by _____ cm deep by _____ cm high. The key was located _____ cm from the floor and could be transilluminated with a red light. The food aperture was located _____ cm above the floor (*what were the dimensions)*. Food was presented by an electrically-operated food magazine.

Procedure

The pigeon was reduced to its _____% weight (*experimental weight*) and placed in the experimental chamber for a _____ minute (*how long*) session of observation only. Following this observation session, magazine training was begun. During this training procedure, the magazine was operated approximately once every minute. Key peck shaping was begun by following successive approximations to key pecks with food presentations. Reinforcers were then delivered when each

key peck occurred (a continuous reinforcement schedule or CRF). Under the CRF

schedule, _____ reinforcers (*how many*) were delivered. Following the CRF

schedule, an _____ (*what schedule was*

implemented after CRF) was then implemented. In this schedule, food randomly

followed either one, two, three, or four prior responses.

Following approximately _____ reinforcers (*how many*) with this intermittent

schedule, extinction was put into effect. In this procedure, food presentation did

not occur. Following _____minutes (*how many*) of extinction, the pigeon was

returned to its home cage.

> Add a paragraph that you write on your own on how the spontaneous recovery
>
> procedure was carried out.

Results

In the present experiment, reinforcers were used to successively

approximate key pecking in a pigeon. The shaping procedure provided _____

reinforcers (*how many*) for successive approximations to a key peck followed by an

intermittent schedule of reinforcement. The behavior was deemed stable

following _____ intermittent reinforcers (*how many*). A cumulative record of the

last session is illustrated in Figure 1. The left portion of the cumulative record

shows the last _____ reinforcers (*how many*) under the intermittent schedule.

Approximately _____ responses (*how many*) occurred. The mean rate was _____

responses (*how many*) per second. This was followed immediately by _____

minutes (*how many*) of extinction. As can be seen in the right portion of the

figure, responding continued at a regular rate for about _____ minutes (*how many*)

and then sporadically for _____ further minutes (*how many*). Within _____

minutes (*how many*), responding ceased for ten minutes.

During the extinction schedule, the following behaviors occurred

_____ (*describe what behaviors occurred, such as wing flapping and/or*

head turning).

Figure 2 provides a cumulative record of the behavior during the test for

spontaneous recovery. As can be seen, _____ responses (*how many*) occurred

during the 15 minute observation period.

| (Describe any other behavior that occurred during the extinction schedule.) |

Discussion

The present experiment demonstrated that the rate of an arbitrary

behavior can be controlled by contingent reinforcement. For pigeons, the operant

level of key pecking is essentially _____, (*did key pecking exist before*) therefore

virtually any key pecking would demonstrate the effectiveness of reinforcement

if that rate returned to essentially zero when the reinforcer no longer followed

that response. The present experiment demonstrated exactly that. The rate

changed from zero responses per second up to _____ (*how many responses*) and then

back to zero responses per second after extinction. This finding systematically

replicated Skinner's (1938) findings with rats and is consistent with a wide variety of findings documented in Ferster and Skinner (1957).

It is interesting to note that the extinction procedure occasioned the following behaviors. _____

_____

(*e.g., wing flapping, head-turning*). An implication of the occurrence of these behaviors when extinction was implemented is that variability increases in extinction. These behaviors increase the likelihood that a behavior appropriate to a changed contingency will be reinforced.

The spontaneous recovery procedure revealed an important dimension of extinction. At first blush, the total loss of behavior during the first extinction session implied that all traces of conditioning had been removed. However, the spontaneous recovery test revealed that the key pecking behavior had not been removed, rather that it was only suppressed.

The implications of this research are _____

_____

(*what has this experiment shown?*).

> Provide an example of how this can work in an applied setting.

References

Ferster, C. B., & Skinner, B. F. (_____). (*when was this written?*) . *Schedules of*

reinforcement. Englewood Cliffs, NJ: Prentice Hall.

Skinner, B. F. (1938). *The behavior of organisms.* New York: Appleton Century

Crofts.

Add any other references that you used.

All references must be written in APA format (Publication Manual of the American Psychological Association, 6th Ed. Examples of APA style references can be found in your lab manual, previous references sections of other lab reports, or at www.apa.org.

You may not have references that you did not use.

Anything such as a paper or article that you used in your paper but did not cite is a form of plagiarism! You must reference all your information sources.

Photograph the Cumulative Record you will be using, crop it in PhotoShop, then save it as a file. Finally, insert that file into your word processing program at this point. Alternatively, Xerox the cumulative record of final intermittent schedule and first extinction schedule here.

Figure 1. Cumulative record of the last portion of the intermittent reinforcement

procedure and the first exposure to extinction. Time proceeds from left to right.

Consecutive responses step the tracing up. The pip in the record designates the

points where the reinforcer was delivered.

Figures are variables set into meaningful space. The horizontal axis (abscissa) is almost always the independent variable. The vertical axis (ordinate) is almost always the dependent variable. Stay within the same margins allowed for text pages. Be neat and accurate.

The best way to do a figure of a cumulative record is to first Xerox the record on to a sheet of paper (enlarged or reduced and positioned depending on what you wish to show), then print the running head, page number, and figure caption on to that piece of paper. The second best way is to Xerox the record (enlarged or reduced and positioned as necessary), and neatly print the running head and page number by hand.

Do not include figures without referring to them in the manuscript text. The most important points brought out in the table or figure must also be stated in the results section.

Insert a picture from a file or Xerox your Cumulative Record of the second extinction session here.

Figure 2. Cumulative record of the second extinction session. Time proceeds from left to right. Consecutive responses step the tracing up. The pip in the record designates the points where the reinforcer was delivered.

Daily Data Sheet

Student ID _____   Experiment # ____   Session # _____

Date:, ^^Monday, January 13, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Wednesday, ^^January 15, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date Wednesday, ^^January 22, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____   ad lib
_____   85% weight
_____   80% weight
_____   75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

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Daily Data Sheet

Student ID _____   Experiment # ____   Session # _____

Date: Monday, ^^January 27, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # ____   Session # _____

Date: Wednesday, ^^Jan. 29, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale?   ☐

Before session weight _____

Tare scale?   ☐

Place arrow in box pointing to where today's weight would fit

_____   ad lib
_____   85% weight
_____   80% weight
_____   75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Monday, ^^February 3, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

EXPERIMENT 2

Intermittent Reinforcement

If you reinforce only every 25th response, you will prove to yourself that:
1. **every response need not be reinforced in order for it to be maintained**
2. **behavior is weak when reinforcement is unlikely; and behavior is strong when reinforcement is likely.**

Your previous lab exercise allowed you to see for yourself the impact of a reinforcer on a behavior. You found that the rate, probability, or momentum of a behavior is governed by its consequences. If food follows pecking, then pecking occurs. If no food follows pecking, then pecking ceases to occur. If you catch fish in one particular spot, then you are more likely to fish in that location again even if on some days you catch nothing. If you no longer ever get fish there, then you no longer fish there.

By now you should have come to realize that human behavior comes to be what it is as the result of reinforcement. It is literally the case that reinforcement has made you what you are, and reinforcement has the power to make you become what you want to be.

A second very important principle of behavior is that not every single instance of a behavior need be reinforced. We need not catch a fish every 5 or 10 seconds to continue fishing in a particular spot. If we are being paid to plant trees on a hillside, we need not be given a piece of candy after every single tree we planted. We need not win the jackpot every single time we pull the arm of a one-armed bandit. This lab will help you understand how intermittent reinforcement can control behavior.

This lab will also be the first to explicitly focus on giving you experience seeing how behavior differs depending on <u>exactly</u> what stimuli are present at the moment of reinforcement (i.e., signal that a reinforcer will occur following the next response). You will discover over the course of the semester that each pattern in the payoff for a behavior produces a pattern in the resulting behavior. In this lab you will observe the behavioral effect of reinforcement occurring only in the presence of having done some specific amount of work. For example, if you got paid each time you moved 500 more bricks to a truck, or only after walking 25 more steps, or only after making 14 more widgets.

For example, 500 bricks then a token, 500 bricks then a token, 500 bricks then a token, and on and on and on. This type of payment schedule is called piecework in manufacturing.

In this lab, you will require 25 pecks before providing a reinforcer for a response. More productively stated, you will reinforce a peck only in the presence of the pigeon having pecked 24 previous times. This procedure is known as a fixed-ratio schedule or an FR schedule. That is, there is a fixed ratio between the number of pecks and the occurrence of the reinforcers (in this case 25:1).

You are carrying out this and subsequent lab procedures so you can prove for yourself how **the stimulus conditions immediately preceding a reinforced response come to strongly control the reinforced behavior (key peck). Those stimuli that occur when reinforcement for key pecking is not imminent are not as likely to control key pecking.** As a result, you will be able to unravel why an organism behaves as it does and you will be able to control the future behaviors of yourself or someone else.

Take Home Message Demonstrated by This Lab

On a schedule such as a fixed ratio, the start of the responding is never followed by food while at the end of the ratio requirement food always occurs. As a result, at the start of the requirement responding is slow, while at the end of the requirement responding is strong.

Experiment 2 Overview and Timeline

In this lab you will generate an FR 25 performance and then stabilize it. This experiment is broken into three tasks. Naturally, you cannot proceed immediately to an FR 25 requirement after extinguishing key pecking in the previous lab. You will first have to reshape key pecking, strengthen that behavior, then shape an FR 25, then finally run an FR 25 until the behavior becomes stable at its final equilibrium or asymptote.

If you need more work with your pigeon in order to carry out the minimum requirement of this lab, be sure to start coming in extra days soon enough to get your experiment in on time. Don't wait until the last minute to try to catch up.

It is possible that you may obtain an FR 25 and therefore finish the first three tasks of this lab on your first session. On the other hand, it may take you several sessions to establish an FR 25. In either case, you must then carryout at least three full sessions at FR 25.

If you wish, proceed to the supplemental task if you have time before the deadline for writing up and turning in this lab. Alternatively, you may write up and turn in your report and proceed onto the next experiment.

Experiment 2 Time Line

Session 1:   Prior lab / Start this lab by reshaping and strengthening a
               key peck and establishing an FR25
Session 2:   FR stabilization
Session 3:   FR stability
Session 4:   FR stability
Session 5:   FR stability (three full sessions after criterion)

Write-up of Lab 2 Due at the beginning of the lab period on ^^February 26, 2020.

I. Task: Reshape a Key Peck

Do not attempt to do any portion of this lab until you have read the instructions for the entire lab.

Apparatus Preparation.

At the end of the spontaneous recovery task of the previous experiment (approximately 15 minutes through the session):

Press **S* Mode** until the little green light goes **on**.

Procedure: *Reshape a Key Peck*

Reshape key pecking by reinforcing successive approximations to a key peck. This is exactly the same procedure as was used in Task III of Experiment 1. Continue this shaping procedure until you get a key peck. You should be able to establish reliable key pecking very quickly.

Criterion to Proceed

* *Proceed to the next task once a key peck occurs.*

II. Task: Strengthen Key Pecking

Apparatus Preparation.

At whatever point in a session a key peck occurs, press the **S* Mode** button to turn the little green light off (**S* Activate** mode).

If you are at the beginning of a session

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple Schedule Key 1 Red** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* Mode** if necessary.

Procedure: *Reimplement intermittent reinforcement*

You will now require, on average, several pecks for each reinforcer just as you did in the previous lab. This is an intermittent reinforcement schedule, and it makes responding more robust. Occasionally require 2 pecks or 3, or 4 or 5 pecks for each reinforcer. The specific requirement must **randomly** change. You are NOT simply increasing the work requirement up to 5 pecks, but rather you are providing a reinforcer after 1, 2, 3, 4, or 5 pecks equally often. The exact amount must be unpredictable.

Following the next to the last response in each sequence (or during reinforcement if you choose to reinforce the first response this time), press the **S* Activate** button. The green light will flash, and the next key peck will automatically and instantaneously activate the reinforcement magazine.

Additionally, reinforce closely spaced pecks. If the bird very rapidly pecks two, three, or more times in a row, reinforce that burst immediately, even if you had intended to require more pecks. This is accomplished by pressing the **S* Activate** button in the middle of a burst of responding. When you do that you are establishing "having just pecked an instant ago" as a stimulus that signals that

the next peck will be reinforced. As a result, the bird will peck at a high sustained rate.

It is likely that you will be able to proceed to the next step while still in the first session.

In the event that you have not completed this segment of this assignment when the bird only slowly eats, then terminate the session and pick up where you left off at the beginning of the next session.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* *Proceed to the next task when you have recovered strong consistent responding, (approximately 10-15 reinforcers).*

III. Task: Shape an FR 25

Apparatus Preparation

If you are continuing a session, there is no change in apparatus from the previous setup.

If you are at the beginning of a session

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple Schedule Key 1 Red** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S*Mode** if necessary.

Procedure: *Shaping an FR 25*

Successively approximate an FR 25 very much like you established your intermittent schedule in the previous task, however this time continue sliding the high requirement up while keeping some shorter requirements. For example (the exact numbers do not matter), after reinforcing after 1 peck, then required 4, then 2, then 5 pecks. The sequence could continue as follows: 1, 5, 9, 3, 8, 1, 15, 4, 10, 20, and 3. Note how reinforcers continue to be available following short runs of responses but that the upper requirement keeps getting larger. Continue increasing the high end until you are reinforcing a variety of response counts, such as 10, 2, 25, 15, 8, 7, 25, and 12. Be careful not to simply alternate between a very long run and one or two pecks. If you do, then the bird will tend to stop after failing to get a reinforcer among the first handful of pecks. Make sure the behavior has enough strength that you can increase the requirement, but do not stay at one step too long or it will make it more difficult to go on to an even greater requirement.

Following the next to the last response in each sequence, quickly press the **S* Activate** button. The next key peck will automatically activate the reinforcement magazine.

As before, immediately reinforce any string of fast pecks whenever they occur by pressing the **S* Activate** button in the middle of a very fast burst of responding, but remember to increase the number you require for reinforcement and occasionally reinforce short, medium, and long bursts.

Very carefully watch the bird's behavior. Get to know what it can do and what it cannot do. Slide the requirement up as quickly as you can, but not so quickly that the bird stops pecking for extended periods. Always push the bird to do more, **but always also reinforce short or medium runs of pecking.** Occasionally, you may require too much and you will have to retreat to a lower requirement, but in the long run, you will move up faster, as long as you demand more but don't always demand too much. If you think about it, this is exactly the same task that will be required of you when you are practicing your profession with people. Working with your pigeon is essential experience for a successful career. This bears repeating: your success as a psychologist in whatever area you choose will depend upon your ability to help people acquire the behavior they wish. If helping people develops their behavior was so simple any idiot could to it, then there would be no need for psychologists and you would have a very bleak future as a psychology major or minor. Give yourself a skill (by learning how to control the behavior of your pigeon) that will reward you by giving you back a good living, and the satisfaction of helping people.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* Proceed to the next task when the bird responds for extended times and can do an FR 25 without much of a break during the run and the lab assistant has signed your data sheet indicating you can proceed.

IV. Task: Obtaining an FR 25 Steady State

Apparatus Preparation

If you are continuing a session, there is no change from the previous apparatus setup.

If you are at the beginning of a session

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Simple Schedule Key 1 Red** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* Mode** if necessary.

Procedure: *Stabilize the FR 25*

Reinforce **only** after 25 pecks and reinforce evey 25-peck sequence. Do <u>not</u> reinforce short runs. Require that every run be 25 pecks (that is the point of this lab). Continue with this exact same procedure for at least 3 full sessions. When the 24th peck of a sequence occurs, press the **S* Activate** button. The next response will be automatically reinforced. Try to be as accurate as you can but if you miss by one or two, it will not make a big difference in the behavior, but errors larger than that can have a dramatic effect. Have the lab assistant OK your bird's performance before you start the 3-sesion baseline and also after you complete the 3-session baseline. You will observe that the behavior immediately after a reinforcer weakens when no short sequences are reinforced.

To End the Session:

1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.

3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Performance to be Expected: Steady State (FR 25)

Student: Session
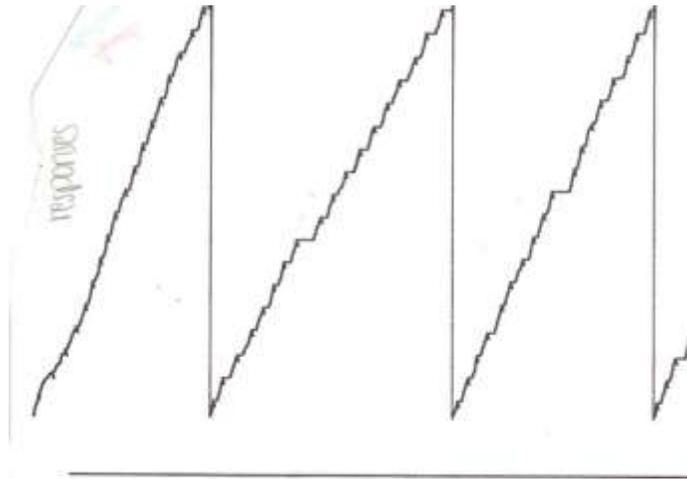
Student: Local
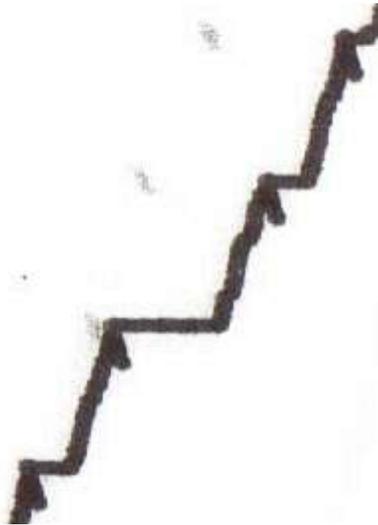
Criterion to Proceed

*** Proceed to the next task after you have 3 full sessions of FR 25 performance and the lab assistant's approval.**

Supplemental Procedure (Optional)
Do Task V if you have time.

V. Task: Obtaining an FR 100 Steady State

Apparatus Preparation.

Standard start-up protocol.

Procedure: *Shape an FR 100*

Shape an FR 100 in somewhat the same way you shaped an FR 25, but do not provide many reinforcers for less than 25 pecks. For the most part, you want to reinforce only after 100 pecks, but on rare occasions if the behavior is very weak, reinforce after fewer pecks especially if they occur in a burst. As soon as the behavior is strong enough, reinforce only and always after 100 pecks (press **S* Activate** button after 99 pecks).

It would not be unusual to get a rougher performance than you obtained under your FR 25. Expect the behavior following reinforcement to be very weak with pauses.

Record your final data from your data display at the end of the session.

Performance to be Expected: Steady State (FR 100)

Student: Session
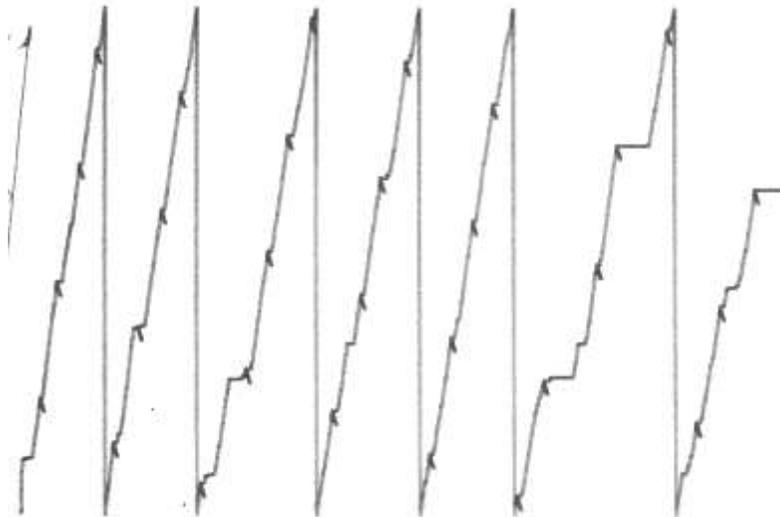
Criterion to Proceed

* Continue this lab until you need to write up this experiment and then proceed to Experiment 3.

Writing Your Research Paper

The following sample paper is a template for your research paper.

You must fill in the blank spaces, write material on your own where indicated, then type, and print out your paper on your own. **It is important that you type for yourself the prewritten sections of your paper because it will provide you with a staged exposure to the final requirements of this course and therefore make the final requirement easier.** You are getting credit for typing your paper yourself.

Do not share the typing responsibility. That is a form of plagiarism and will result in an F for the semester.

You may not work with anyone. Do not discuss your ideas or how you are going to write your paper with anyone. You cannot use as an excuse for unusual similarities with someone else's paper that you talked to them about your paper.

Refer to the "How to Write a Lab Report" section of this manual, or the lab assistants, for additional information on writing a lab report.

The Lab Reports must be typed, stapled, formatted correctly (including being typed double-space with a serif font such as Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point, and neat. You must include your actual cumulative records (or Xerox copies) stapled as a group to the back of the research paper.

Note that you use your student ID number rather than you name. Observe the sample paper on the bulletin board of the lab to know how your paper should appear. You will lose points if our paper is not formatted correctly.

If you do not have a computer and/or a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you a day or so to learn how to type and print a paper. A second reason to start early is that you may experience a computer hardware problem that could cause your paper to be late.

Be sure to:
1. Double space and print on only one side of the paper.
2. Fill in all of the blanks in the template or sample paper.

3. Write material on your own where indicated. Do not simply retype the instructions. For example, when it asks for "your student ID number," type your student ID number and do not retype "your student ID number."
4. Submit your paper to the Canvas plagiarism site before the beginning of the lab on the day it is due.
5. Hand your lab report directly to the lab assistant before the beginning of the lab on the day it is due.

For sample papers, go to:
      APA's website
      apastyle.org/manual/related/sample-experiment-paper-1.pdf
or
      Purdue University's OWL website
      https://owl.purdue.edu

DO NOT CHEAT. You will flunk the course!

You may not copy anyone else's paper (even the typed template from a previous lab or your own paper from a previous semester).

The Canvas Plagiarism Checker will discover you are cheating and you will receive an F for the semester for doing so.

Control Over Behavior by a Subtle Discriminative Stimulus

_____

(your student ID number)

_____

(your lab section and time)

Jacksonville State University

Abstract

The influence that a subtle discriminative stimulus can have over behavior was

demonstrated in this experiment. First, a key peck was shaped and

strengthened with intermittent reinforcement until an FR 25 was established. A

steady state FR 25 was obtained following _____ *(number of)* reinforcers. This

procedure took approximately _____ minutes (*number of*) spread over _____

sessions (*number of*). It also found that the greater number of required responses,

the longer the pre-run pause. These findings were taken to support the view

_____ _____ (*what can happen

to different behaviors?*).

NOTE: If an FR100 was obtained, make sure to adjust your lab report to include those findings. Adjust the procedure, the results, the discussion and the abstract. Compare the results you obtained under an FR 25 with an FR 100 in the results, discussion, and abstract if you can and how you obtained those findings

Control Over Behavior by a Subtle Discriminative Stimulus

It is apparent that the consequences of behavior importantly affect its rate of occurrence. This effect was convincingly demonstrated by Thorndike (_____) (*year*), but it had been a topic of philosophical speculation for quite some time prior to that (Spencer, 1855). The significance of Thorndike's "law of effect" cannot be overstated. Virtually every human behavior problem can be seen as too much or too little of some _____ (*something that can be observed*).

It could be argued that reinforcement is only a "parlor trick" and can be used to account for only relatively simplistic behavior such as a single key peck. This line of reasoning would contend that extended performance on a task must be accounted for with some more _____ (*inner agent*) or cognitive machinery.

Ferster and Skinner (1957) addressed this issue in their initial work on schedules of reinforcement. They extended a "common knowledge" that when a stimulus such as a green light signals that food is available for a response, then the animal will _____ (*what action*) when that stimulus occurs. Ferster and Skinner (1957) convincingly demonstrated that the signaling or _____ (*formal term for cue*) effect of environmental events was much more pervasive than those that were as simple and as obvious as the occurrence of a green light. They showed that explicit stimuli, temporal stimuli, and the organism's own _____.

(*something that can be observed*) can all function as discriminative stimuli. For

example, if an organism is reinforced only following the 24th response, then that

stimulus (i.e., the 24th response) will come to control pecking while stimuli quite

different than the 24th response, such as not-having-responded at all or having

responded only a few times, will control a different behavior.

The present experiment assessed the potential discriminative effect of a

particular response count functioning to control responding by implementing a

fixed ratio schedule. If the response count can function as a discriminative cue,

it would be predicted that _____

_____ (*what will be the effect of the response count*

functioning as a discriminative stimulus for pecking).

Method

The Method section consists of the Subject, Apparatus, and Procedure sections. It tells the reader precisely how the experiment was conducted. Include everything necessary to replicate and obtain the same results and nothing that is unnecessary. Include the relevant; exclude the irrelevant. There is no introduction following the word Method. The first line of the Method section is the title of the Subject's section. The Method section does not begin on a new page.

Subject

One pigeon _____

_____ (*details about the pigeon*).

Water was freely available in the pigeon's home cage.

> Include how many, what species, the population from which they were selected, and any other pertinent details concerning the subjects in particular (i.e., where they pre-exposed to other experimental procedures). Provide the information necessary to replicate the study with respect to subjects.

Apparatus

A standard operant conditioning chamber was used. It had three sides of aluminum, a ceiling of aluminum, and a front of _____. The internal dimensions of the chamber were ___ cm by ___ cm by ___ cm high. The food aperture was approximately ___ cm from the floor, and the food was presented by an electrically-operated food magazine. The key was ___ cm from the floor and was translucent enough to be illuminated with a red light located behind the key.

> Describe the apparatus sufficiently enough that someone could replicate your study with respect to apparatus or setting. Describe the apparatus only insofar as it interacts with the subject. If it was not used, do not describe it. Do not describe the way the apparatus interacts with the experimenter unless it has a direct bearing on the procedure or the results. You must use the Standard International System of Units (metric system).

Procedure

The pigeon was maintained at 80% of its free feeding weight. The previous experiment concluded with _____ schedule (*last schedule pigeon had been exposed to in Experiment 1*), so a key peck was reshaped by initially reinforcing successive approximations of the key peck behavior with food pellets. Key pecking was then

reinforced on a _____ (*which schedule of reinforcement*) for ____

reinforcers (*how many*). The behavior of key pecking was then strengthened with

an intermittent schedule. In this procedure

_____

(*how was this schedule done*) were presented by successively incrementing the

highest requirement while preserving some shorter requirements. Following

_____ (*how many*) intermittent reinforcers, an FR 25 was implemented. In an FR

25 schedule key pecks are

_____

_____ (*how often are key pecks reinforced*). The

FR 25 was maintained for _____ (*how long*).

The reader must know everything that happened to the subject, that is, all of the information necessary to replicate the study. Procedures are written in terms of a sequence of events. Give an overall view then a detailed description. Include maintenance schedule, how the independent variable was administered, and how the dependent variable was recorded.

If you did the FR 100 procedure, be sure to adjust what your procedure section describes.

Results

In sum, the rate of responses gradually _____ (*increased or*

decreased) as the reinforcement contingency required _____ (*more or less*)

responses per reinforcer.

During the portion of the session when the key peck was being strengthened with an intermittent schedule, the response rate was _____ (*how many*) responses per second. _____ (*how many*) responses were emitted, with a total of _____ (*how many*) reinforcers during that _____ period (*how long*). During the initial session, that implemented only an FR 25, the response rate was _____ (*how many*) responses per second. This session lasted _____ (*how long*) seconds. _____ (*how many*) responses were emitted and _____ (*how many*) total reinforcers were obtained. During the final session of maintaining a steady state FR 25, the response rate was _____ (*how many*) responses per second. This indicates that an FR 25 maintains _____

_____

(*what typical type of behavior*).

Figure 1 illustrates _____

_____

(*what does Figure 1 show*).

Describe the daily rates of responding on an FR 25 schedule. If you did any of the supplemental tasks, describe the daily rates under those schedules and describe how they were similar or different. Provide both a figure for the final session of an FR 25 and the final session of your FR 100.

Describe the pause between reinforcement and the run of responses terminating in reinforcement ("pre-run pause," or as it's sometimes known as "post reinforcement pause"). Describe how the duration of that pause changed from the first FR 25 of the last two sessions to the last pause of the last two sessions. Refer to a cumulative record so the reader can see the change for themselves. If you did any

of the supplemental task, describe the pauses under those schedules and compare and contrast them. Prove the difference by showing a segment from a cumulative record for the last two or three reinforcers of each schedule if you did the supplemental schedule (or construct a figure).

Or construct a figure with the amount of pre-run pause on the y-axis and increasing experience with the schedule on the x-axis. Alternatively, you could provide the cumulative record of the FR 25 including the first change to an FR 100. Many possibilities are available to you.

First briefly present the main trend of the findings with respect to the main procedural manipulation. Then logically present the relevant results of the procedure. Present or show data to justify your assessment of the major trends. Order your presentation with respect to categories of results. **Do not introduce theory or interpretations in this section.** This is a data section.

Keep in mind that your topic is Psychology and that the behavior of the organism (not the organism itself) is the dependent measure. <u>Describe the behavior, not the organism</u>. A handy rule of thumb is "you should avoid altogether any reference to the subject (the organism) in the results and discussion sections." For example, "the response rate increased ...." rather than "the pigeon pecked faster".

In simple terms, what was found? What happened?

Discussion

Ferster and Skinner's (1957) predictions were supported in that the

present experiment displayed response rates that corresponded with their

original findings. Based on simple observation, the rate of responding very close

to the stimulus condition that set the occasion for reinforcement (i.e., the 24th

peck), was _____ (*faster or slower*). The response pattern at the beginning

of the interval was _____ (*faster or slower*), and controlled _____

_____ (*what happened towards the end of the response*

sequence). The response rate increased across the response sequence. In sum, the

further from the count that was the discriminative stimulus, the weaker the key

pecking.

A _____ (*what type of stimulus*) is a stimulus in

the presence of which responses are reinforced. When not present, responses are

not reinforced. This makes responses more likely to occur in the presence of the

discriminative stimulus. When the pre-run pauses in the FR 25 were compared,

the early exposure to an FR 25 had a steadier rate of response with a shorter

pre-run pause than following more experience. These findings suggest

_____

_____

(*how does the amount of work influence behavior*).

The implications of these findings are _____

_____ (*what

does this experiment imply*).

An example of how these findings could aid in an applied setting is, ____

_____.

Understanding when a response is more likely would help _____

_____.

Similarly, knowing what subtle stimuli can influence behavior would help

_____.

Discuss whether your experiment revealed the same results as Ferster and Skinner had hypothesized. Also discuss any difficulties encountered and how they may have affected your data.

The Discussion section answers the question "SO WHAT?" or "WHAT OF IT?" It discusses what the results of the research mean. Open this section with a clear statement of support or lack of support of the original hypothesis presented in the Introduction. Recap data to prove the answer to the question regardless of whether they were affirmative or negative. Discuss how your findings are similar to other kinds of things. Help substantiate your conclusions by pointing out similarities and the relevance to your conclusions. The data will answer some questions more than others. Make partial conclusions. State the limitations, qualifications, and generalizations of your statements. Use "but" and "however" type sentences, e.g., "these data suggest this, however, such and such may not have been controlled."

This section is your conclusion and not your results. It is what you think about your results and what they mean, not just a repeat of the results section. Remember that your data are real and not hypothetical. It is assumed that you have thought about the ramifications and implications of your research more than anyone else, however never be final or eternal about your conclusions. Never end a discussion with a gratuitous appeal for more research to be done.

References

Ferster, C., & Skinner, B. F. (1957). _____

_____.

Spencer, H. (1855). *Principles of psychology*. London: Longman, Brown, Green, &

Longman.

Thorndike, E. L. (1898). _____

_____ .

Add any other references that you used.

All references must be written in APA format. Examples of APA referencing can be found in your lab manual, previous references sections of other lab reports, or at www.apa.org.

Any paper or article used and not cited is plagiarism! You must reference all your information sources.

Construct figures(s) for Experiment 2

Select the cumulative record of your final session of FR 25 and then photograph it and make it into a file, then insert it as a picture, or Xerox it. Add any other figures that help you tell your story.

If you carried out the FR 100 schedule provide the final cumulative record for it and write a caption for that figure..

Construct a figure for the last series of fixed ratios completed under Task IV. Additionally, make a similar figure for any supplemental procedures you ran. Select the portions of the record that best represents the bird's behavior for that day (typically the final series of reinforcers, but if the final few FR schedules are atypical, choose some other segment).

Each figure appears on a separate page with the figure caption printed below the figure. Place the running head and page number in the upper right.

Figures are variables set into meaningful space. The horizontal axis (abscissa) is almost always the independent variable. The vertical axis (ordinate) is almost always the dependent variable. Stay within the same margins allowed for text pages. Be neat and accurate.

The best way to do a figure of a cumulative record is to first Xerox the record on to a sheet of paper (enlarged or reduced and positioned depending on what you wish to show), then print the running head, page number, and figure caption on to that piece of paper. The second best way is to Xerox the record (enlarged or reduced and positioned as necessary), and neatly print the running head and page number by hand.

Do not include figures without referring to them in the manuscript text. The most important points brought out in the table or figure must also be stated in the results section. Put the actual figures or tables at the end of the paper.

Figure 1. Cumulative record of the behavior under the first few FR 25 schedules. Time proceeds from left to right. Consecutive responses step tracings up. The pip in the record designates the points where the reinforcer was delivered.

Figure 2. Cumulative record of the behavior under the final exposure to the FR 25. Time proceeds from left to right. Consecutive responses step tracings up. The pip in the record designates the points where the reinforcer was delivered.

> Captions should be concise, but complete enough so that they can be understood without reference to the text. Captions should not unnecessarily duplicate information in the text. Note that the text must discuss the figure. Captions are placed on the same page as the figure following the figure.

Daily Data Sheet

Student ID _____ Experiment # _____ Session # _____

Date: Wednesday, ^^Feb. 5, 2020

> Lab Assistant's Initials Here
> Proceed OK _____ Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Monday, ^^February 10, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Wednesday, ^^Feb. 12, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____
_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Wednesday, ^^Feb. 19, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____   ad lib
_____   85% weight
_____   80% weight
_____   75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

* * Important Note * * *

You will be working on Experiment 3 and Experiment 4 at the same time. The recommended plan is to get started with Experiment 4 over the next few days. As soon as you are comfortable with what you have to do for Experiment 4, get together with your lab partner someplace convenient and carry out Experiment 3. Collecting the data for Experiment 3 should take 3 days of one-hour each.

Experiment 4 will be worked on during your scheduled lab days in the laboratory.

Experiment 3 will be worked on as homework. Note that you are required to spend two homework hours for every contact hour in a course at Jacksonville State University. You may do the lab wherever and whenever you wish, including at home or in the lab at some time you are not running your pigeon. But keep in mind that you must turn it in on time and trying to do it the night before will not work.

Time Lines

Experiment 3 should take approximately 3 days of one hour each. It is due ^^**Wednesday, March 11, 2020.**

Experiment 4 should take approximately 5 and one-half, one-hour sessions. It is due ^^ **Wednesday, March 18, 2020**.

EXPERIMENT 3

Reflex Conditioning

If you condition a reflex, you will prove to yourself that our complex emotions and feelings can be the result of conditioning.

So far this semester we have been examining organismic adaptation or "learning" by following an arbitrary behavior (a peck) with a reinforcer (food). This was all well and good but at this point, we have to stop and more thoroughly examine the complete behavioral repertoire of organisms. As it turns out, **there are actually two different general types of semi-permanently acquired behavior adaptations rather than simply one type of adaptation.**

These two types of behavioral adaptations are similar in some ways and are different in other ways. This is not unlike the fact that the set "people" is actually composed of male and female individuals. For some issues, we don't need to consider the differences between the two, but in other situations the difference is crucial. If you plan to understand behavior or to productively help people with their problems, you must understand both of the two different types of behavioral adaptation, what causes them, and how to make those behaviors happen or go away.

The two types of adaption are based on the two fundamental types of behavior. The behavior of an organism is divided into innate behaviors such as reflexes labeled "respondents" and voluntary behaviors which are labeled "operants". As a matter of convenience the only respondents that we will consider in this course are reflexes in that the adaptations involving innate behaviors are basically all the same, just as any operant can be used to illustrate operant conditioning.

Reflex behaviors like all innate behaviors, are behaviors that inevitably or unconditionally occur if an eliciting stimulus occurs. The stimulus response connection is "hard wired" into the nervous system. The eliciting stimulus is labeled an **unconditioned stimulus** (UCS) because it functions unconditionally for every individual in that species. The innate response is labeled an **unconditioned response** (UCR) because it unconditionally occurs to the unconditioned stimulus for every individual in that species. (Together they are

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labeled a reflex.) Examples of reflexes would be a hand withdrawal to a pinprick and salivation to meat powder in the mouth.

The output or the behavioral half of a reflex is often entirely involuntary in the sense that you cannot voluntarily salivate even if someone offered you $1,000. to do so. In other reflexes such as an eye blink to a puff of air in the eye, the behavior can also be an operant. Someone can offer you $1000 to blink your eye which you would likely do immediately. In addition to the inability to turn on many reflexes voluntarily, many learned reflex responses (e.g., a phobia) cannot simply be voluntarily turned off by a person either.

Operant behaviors, on the other hand, are not hard-wired behaviors to a specific stimulus. The output or the behavior is voluntary in that you can emit an operant at any time or in any place, especially if someone offered you money to do so. Examples of operants would be watching one TV program rather than another, and picking something up.

Each of these two behavior types (reflexes and operants) can come under the virtually irresistible control of an arbitrary stimulus through Pavlovian conditioning and Thorndikian conditioning, respectively. When we salivate, because we see the sign for our favorite restaurant, we are exhibiting the results of Pavlovian conditioning: a learned reflex. The learned reflexive behavior is labeled a **conditioned response** (CR) because it is conditional on our experience. When we go fishing in only one spot rather than another, we are exhibiting the results of Thorndikian conditioning: a learned operant.

While the acquisition of semi-permanent adaptive behavior as the result of experience is by far the most important detail of learning in both reflex and operant conditioning. There are differences between reflex conditioning and operant conditioning. The spirit of the difference between them is easy to understand with a metaphor.

If it's meaningful to say that a stimulus and a response are "connected" when the response occurs virtually whenever the stimulus is presented then:

1. Operant conditioning is the "connection" of an **arbitrary response** (e.g., a key peck) to whatever arbitrary stimulus is present (e.g., a key light) when the reinforcer was presented. For example, if food follows pecks to a red light, then when the red light is illuminated a peck will usually occur again. This process is thought to occur because under normal conditions food is not available but if a response occurs then the food is presented. In lay terms, a stimulus that precedes a voluntary response that is reinforced will come to make the response occur whenever that stimulus occurs again.

2.   Reflex conditioning on the other hand would be seen in this metaphor as the "connection" of a **reflex** response (e.g., salivation) to whatever arbitrary stimulus preceded the unconditioned stimulus. Normally meat powder (UCS) causes involuntary salivation (UCR). If a bell (CS) regularly precedes putting meat powder into an organism's mouth, after a few repetitions, then a bell itself will come to elicit that salivation reflex (CR). Pairing of the bell and meat powder could be seen as establishing a learned "connection" between the two. For example, if the smell of a particular perfume or cologne worn by a past loved one occurs even after many years, then the good feelings you had with that person will be involuntarily reinstated even in that person's absence. This process is thought to occur because normally the reflex elicitor does not occur but whenever it does, it is preceded by an arbitrary stimulus. In lay terms, a stimulus that precedes a stimulus that elicits a reflexive response will come to make the reflexive response occur on its own whenever that stimulus occurs again.

   This lab will pair the arbitrary stimulus of a touch to a foot with the reflex eliciting stimulus, a Listerine breath strip (which elicits strong salivation). The learned reflex "connection" is exhibited when the salivation response occurs whenever that foot touch is presented again.

   The following reflex conditioning experiment will allow you to prove for yourself that organisms can learn to acquire a reflex response to an arbitrary stimulus (i.e., reflex conditioning) just as they can acquire an arbitrary response to an arbitrary stimulus (i.e., operant conditioning). Initially a foot touch elicits no change in salivation. However, over the course of the experiment, salivation will come to occur to this arbitrary neutral stimulus.

Take Home Message Demonstrated by This Lab
   Any stimulus that precedes a reflex elicitor will come to elicit the reflex behavior or a compensatory reflex derived from the original unconditioned reflex.

Experiment 3 Timeline
   Session 1: Conditioning a reflex (about an hour)
   Session 2: Stabilizing the conditioned reflex (about an hour)
   Session 3: Extinguishing a conditioned reflex (about an hour)

Write-up of Lab 3 Due at the beginning of the lab period on ^^October 23, 2020.

I. Task: Conditioning a Salivary Reflex

Subject.

You will do this experiment on your human partner. The lab group can choose who will be the experimenter for this reflex conditioning lab and the other person will be the experimenter in the second reflex conditioning lab; alternatively, you may use a friend as your subject.

Apparatus.

1 Listerine Pocket Pack Breath Strips

1 pair of scissors

1 Q-tip cotton swab

1 small paper cup of water

1 paper plate

1 digital watch or timer

1 blindfold

1 pair of latex gloves (if desired)

1 device that will play music for more than 90 minutes as a background noise

Apparatus Preparation

Cut 12 breath strips into quarters with a scissor and place them onto the paper plate.

Place the paper cup of water next to the plate.

Place the Q-tip on the paper plate.

Procedure Overview

Read this entire overview, do the practice procedure, then read the detailed step-by-step instructions before starting the experiment.

In sum, the experimenter waits for a time then touches the subject's foot with their foot. The subject then sticks out their tongue. The experimenter then touches the subject's tongue with either a blank Q-tip or with a Listerine strip. The subject then reports how much they salivated.

Implementing each conditioning trial should take about 90 seconds: that is to say the time between trials or the intertrial interval (ITI) is about 90 seconds. With this delay, the UCS breath strip in the mouth should be very different than the resting ITI conditions and should therefore lead to strong conditioning.

Practice / Calibration Trials

This practice procedure is to get the experimenter and the subject comfortable with the various steps.

Find a location where the subject and experimenter can sit across from one another at a table with the subject blind-folded in a comfortable position that they can maintain for about an hour. One possibility is with the chin on the fist and the elbow on the table. The experimenter is to find a way to sit with their foot under the table next to the subject's foot so that the experimenter can quickly and conveniently touch the subject's foot without the subject knowing it is coming (because it will be very easy for the subject to condition to any confounded changes in the environment). Additionally, the experimenter must be able to pick up the Q-tip and pre-position their hand in front of the subject's face above their mouth without the subject being able to tell. When the tongue comes out, it needs to be easy to simply lower the Q-tip to the tongue because this must be done very quickly.

Provide a proforma explantion to your subject of what you will be doing even though they read this chapter, then <u>blindfold</u> your subject and <u>turn on the background noise</u>.

The experimenter will practice:
1. During the time between trials the experimenter:
   1) enters the actual time the Q-tip touched the tongue
   2) looks at how long to wait before administering the next trial
   3) what type of trial is coming up, and
   4) approximately what time they should get ready by loading or not loading the Q-tip and positioning their hand above the nose,
2. When a UCS trial is to occur, the experimenter touches the Q-tip into the water and then: picks up a breath strip by touching the wet Q-tip on the breath strip, or not picking one up if it is a blank trial. In either case, they position their hand above the subject's mouth
3. when the ITI time is up, without warning the experimenter touches the subject's foot with their foot while holding the Q-tip above the subject's mouth
4. then quickly touching the Q-tip to the center of the subject's tongue when

the subject sticks their tongue out. A foot touch followed by the Q-tip touch should occur totally without warning and as quickly as possible without it becoming confusing, clumsy, or dangerous.

Note that the touch can be off by a few seconds with respect to the programmed ITI length, but the time from foot touch to Q-tip on the tongue should be as short as possible and still be comfortable to do.

The subject will practice:
1. quickly sticking out their tongue with their mouth open when touched on the foot
2. returning their tongue inside their mouth immediately after the Q-tip touches it,
3. counting silently to 10 seconds, and then
4. reporting how much salivation they experienced.

Carryout four initial blank trials and one conditioning trial spaced according to the practice programming data sheet located in the following section. Initiate each trial at the elapsed time designated on the practice programming sheet. Do not start a trial before the specified time. Do not get up, do not remove the blindfold and do not talk. As is specified on the practice Reflex Conditioning Programming Data Sheet in the next section of this lab, wait 71 seconds on the first trial, then touch the foot, then apply a blank Q-tip.

It is important that the first possibility that the subject can know that a CS and US is coming is the actual touch on the foot. It should be a surprise but not something that startles or cause them to jump. If the experimenter gives signs that a trial is coming by making any "getting ready" signals, then the amount of conditioning will be diminished. The shorter the time from the foot touch until the Q-tip plus breath strip touches their tongue, the better the conditioning.

This bears repeating: **If the experimenter "telegraphs' that a trial is coming by making some getting ready noises such as shifting in their chair, then those stimuli will become the conditioned stimuli <u>rather than the foot touch.</u>** Therefore, be sure to have some background music playing and make some occasional fake getting-ready-to-present-the-CS noises at random times throughout the intertrial intervals. Do not talk <u>at all</u> during the experiment because it will be very easy for the subject to condition to the changes in the pace of the conversation.

During the practice, on blank trials, you place only the Q-tip on their tongue. The experimenter touches the Q-tip into the water and then touches the subject's foot with their foot while holding the Q-tip. When the subject sticks out their tongue, the experimenter immediately places the Q-tip on the center of the

tongue. The subject replaces their tongue, counts silently to 10, and then labels the amount of saliva flowing on that practice trial as the result of only the Q-tip a "0." The experimenter enters the trial start time during the 10 second wait, and the subject's response (i.e., 0) in the appropriate box of the data sheet after the subject reports that value. The experimenter then quietly looks at the programming sheet for what to do next and quietly waits for when to get ready.

These practice blank trials are to allow the subject to know what the minimum amount of saliva is labeled and prove that the foot touch is truly neutral. Keep track of this practice/habituation sequence by placing the salivation rating which is defined as zero on the lines of the Reflex Conditioning Practice / Calibration Data Sheet after the subject says "zero" for those four trials. Recall that the subject is to assign that amount of salivation a zero because that's how much they salivate without any reflex eliciting stimulus. It is how much they salivate normally when no reflex elicitor (the breath strip) is presented. This is the baseline against which your procedure is to be compared.

On the fifth trial of the practice set, following its intertrial interval as specified in the practice sheet the experimenter touches the Q-tip into the water, and then touches the center of one of the breath strips. Then touches the subject's foot with their foot while holding the Q-tip with the breath pad on it. When the subject sticks out their tongue, the experimenter immediately places the breath strip on the center of the tongue. The subject replaces their tongue, counts silently to 10, during that time the experimenter is to write down the actual time the trial was administered. The subject then reports the amount of saliva in their mouth on that particular trial as the result of the breath strip a "10." This is to allow the subject to know the maximum amount of saliva elicited by a breath strip is labeled a 10. The experimenter enters the subject's response (i.e., 10) in the appropriate box of the practice data sheet.

Following this practice, the experimenter and subject are to discuss any problems with the procedure and correct them. This is especially the case for the subject being able to detect that a trial is imminent or that the physical positions are uncomfortable.

Actual Reflex Conditioning Experiment

The experiment proper is then begun. The experimenter is to formally remind the subject of the task by saying: "consider the amount of salivation you experienced on the 4 blank trials during practice as an amount labeled a "0" and the amount of salivation you experienced on the breath strip trial as an amount labeled a "10". Based on those amounts of salivation and those assigned values, I

would like you to rate the amount of salivation you experience on each of the following trials. When given a breath strip you may decide that it is more or less salivation than the amount you exhibited during the practice so you can adjust what number you say below or above 10. When given no breath strip; you may decide that the amount is more or less salivation than the amount you exhibited during the practice so you can adjust what number you say above or below 0."

The experimenter is to follow the procedure as practiced and specified on the "Reflex Conditioning Programming Data Sheet" located in the following section of this manual. Present a breath strip on UCS trials and present only the Q-tip on "blank" trials. The subject counts 10 after each and then reports the amount of salivation. Carry out the trials specified on the programming data sheets exactly like the previous practice trials. Present the touch/Q-tip at the time specified in the Reflex Conditioning Programming Sheet. The rating of salivation from the initial trial onward should be the actual rated subjective amount of salivation whatever amount that is, it need not necessarily be just either a 10 or a 0. The experimenter records the subjectively experienced amount of salivation on each trial including the blank trials on the Reflex Conditioning Programming Sheet.

Note that the blank trials during the experimental procedure are so that you can see how the foot touch is actually coming to elicit salivation even in the absence of the breath strip. The salivation on those trials cannot be just the reaction to a breath strip because none was presented on that trial.

Exactly the same procedure is carried out on the second session (the following day) and uses the second "stabilization" programming data sheet.

As you have probably already guessed: the amount of salivation on the initial interspersed blank trials during the two conditioning sessions will slowly increase to asymptote. Your subject will learn to salivate to a foot touch stimulus by itself even in the absence of the Listerine strip because that stimulus regularly preceded the Listerine strip.

The third session uses the third data sheet and contains only 3 UCS or breath strip trials. The remaining trials are all blank and have no UCS. They are extinction trials. Continue recording the subjectively experienced amount of salivation on each trial. This enables you to see that the learned response was semi-permanent. It continued to occur (albeit less and less) in the total absence of breath strips. The subject continued to salivate to the formally neutral foot touch, but eventually the response extinguishes. Present the trials at the times specified in the Programming / Data Sheet. The amount of salivation on the blank

trials during the extinction procedure of the third session will slowly decrease, i.e., show extinction.

Hypothetical data are illustrated in the following figures. Figures 1 and 2 illustrate baseline salivation to the Listerine strip across the top with solid lines and filled squares. It is how much salivation is caused by placing a breath strip on the tongue. The slowly rising function across the bottom portion of these two figures depicted with dotted lines and asterisks illustrates the increasing salivation to nothing but the foot touch.

Behavior Expected to Occur to Reflex Conditioning Procedure
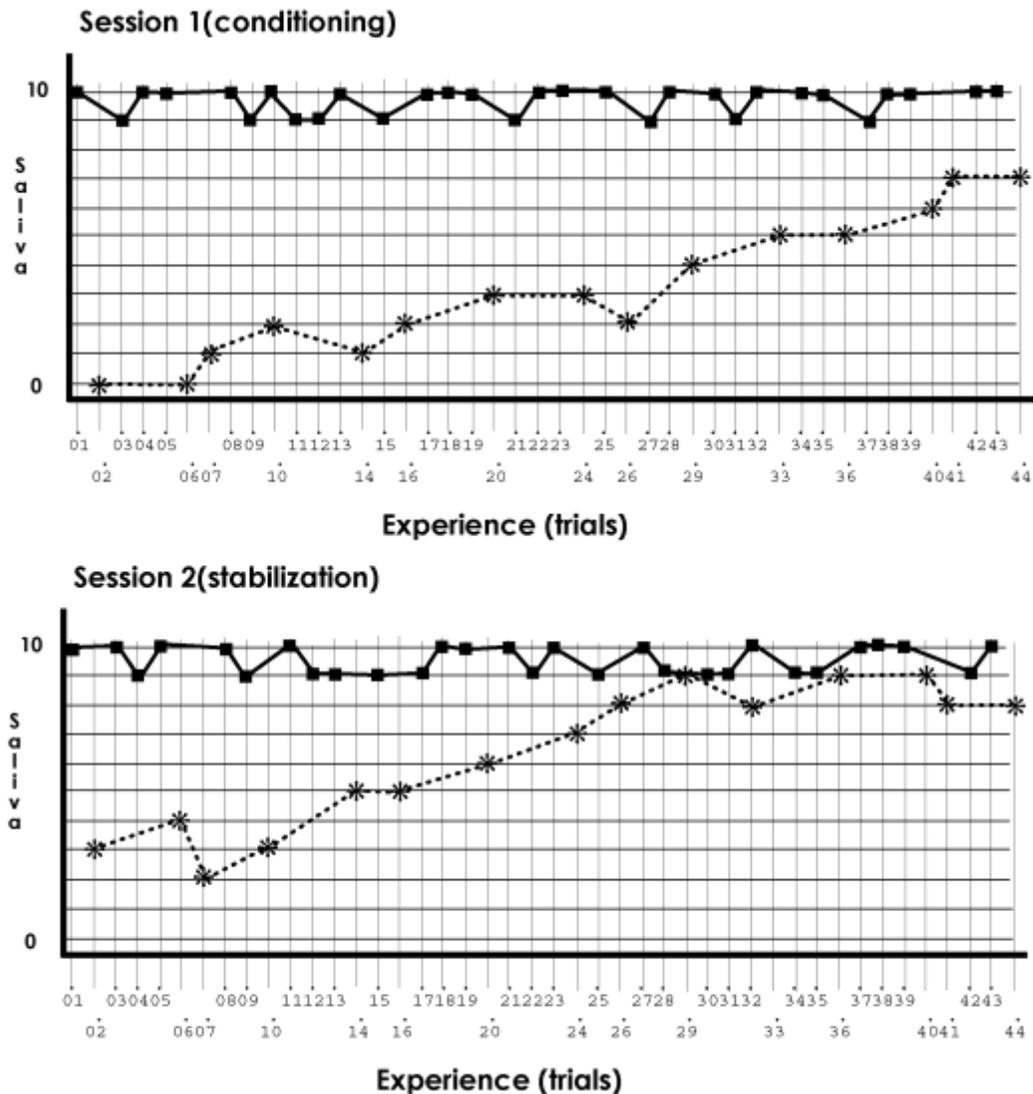
Session 1(conditioning)

Session 2(stabilization)

The upper and lower figures depict the amount of salivation to each of the 44 trials of Session 1 and Session 2. The y-axis indicates the amount of salivation indexed from 0 to 10. Each figure depicts: 1) the amount of salivation following

the application of a Listerine strip. These trials are indicated with the upper set of trial numbers below the x-axis. These are trials 1, 3, 4, 5, 8, 9, 11 etc. The results of that procedure resulted in saliva levels approximating 10 throughout the entire session and the data is shown as the function that extends across the upper portion of the figures for Sessions 1 and 2. 2) The amount of salivation following only a foot touch are indicated across the lower x-axis values. These are trials 2, 6, 7, 10, 14, 16, etc. Data shows a generally larger and larger amount of salivation to each successive presentation of only a foot touch without any UCS, and the data is shown as the function that rises from the left portion of the top frame and after a small drop at the start of the second session continues rising across the bottom frame.

Behavior Expected to Occur to Reflex Extinction Procedure

Experience (trials)
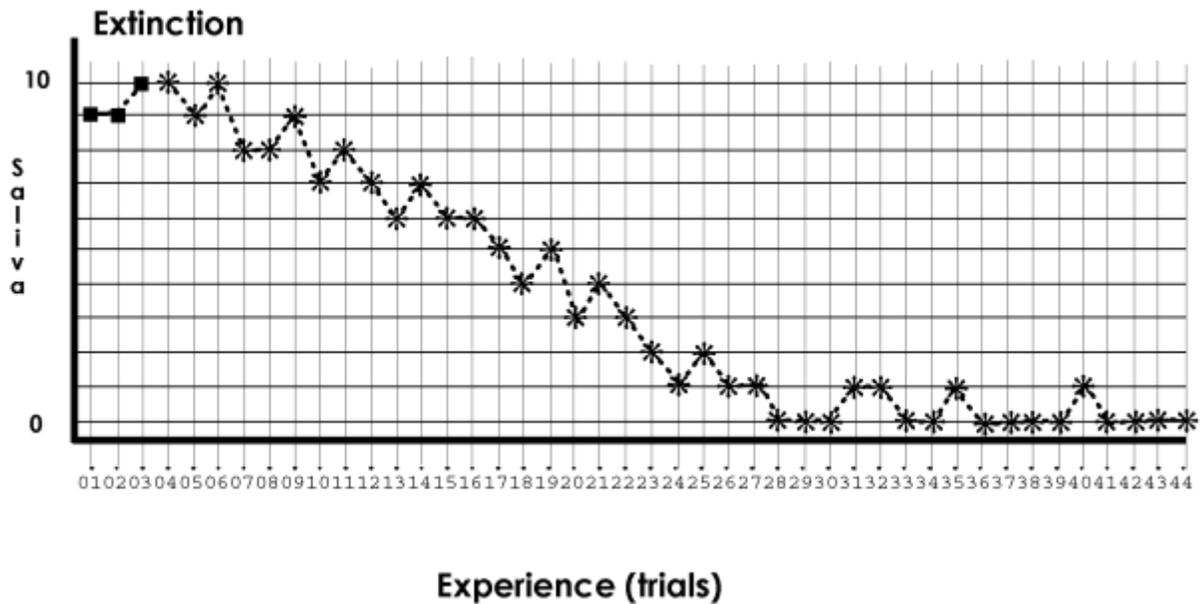
Hypothetical extinction is provided in the above figure. Following the initial three trials containing a UCS, the salivation decreases to the base rate across the 41 extinction trials.

Student ID _____   Section _____

Date   _____

Practice
Reflex Conditioning
Programming Data Sheet

Trial #	ITI	Programmed Cumulative Sec	Programmed Cumulative Min + Sec	Actual Time	Procedure CS	Procedure UCS	Rating of Salivation	Subject's Response
Start		0	0:00					
1	71	71	1:11		touch	blank	Define as 0	
2	58	149	2:29		touch	blank	Define as 0	
3	38	207	3:27		touch	blank	Define as 0	
4	45	272	4:32		touch	blank	Define as 0	
5	130	422	7:02		touch	UCS	Define as 10	

Student ID _____   Section _____

Date _____

Reflex Conditioning
Programming / Data Sheet (Session 1)

Trial #	ITI	Prog Time Sec	Prog Time Min + Sec	Actual Time	Procedure CS	UCS	Rating of Salivation
Start		0	0:00				
1	71	71	1:11		Touch	UCS	
2	58	149	2:29		Touch	blank	
3	38	207	3:27		Touch	UCS	
4	45	272	4:32		Touch	UCS	
5	130	422	7:02		Touch	UCS	
6	89	531	8:51		Touch	blank	
7	81	632	10:32		Touch	blank	
8	63	715	11:55		Touch	UCS	
9	155	890	14:50		Touch	UCS	
10	187	1097	18:17		Touch	blank	
11	54	1171	19:31		Touch	UCS	
12	72	1263	21:03		Touch	UCS	
13	42	1325	22:05		Touch	UCS	
14	97	1442	24:02		Touch	blank	
15	155	1617	26:57		Touch	UCS	
16	89	1726	28:46		Touch	blank	
17	35	1781	29:41		Touch	UCS	
18	69	1870	31:10		Touch	UCS	
19	52	1942	32:22		Touch	UCS	
20	81	2043	34:03		Touch	blank	
21	45	2108	35:08		Touch	UCS	
22	270	2398	39:58		Touch	UCS	
23	75	2493	41:33		Touch	UCS	
24	42	2555	42:35		Touch	blank	
25	76	2651	44:11		Touch	UCS	
26	58	2729	45:29		Touch	blank	
27	38	2787	46:27		Touch	UCS	
28	200	3007	50:07		Touch	UCS	
29	45	3072	51:12		Touch	blank	
30	89	3181	53:01		Touch	UCS	
31	81	3282	54:42		Touch	UCS	
32	63	3365	56:05		Touch	UCS	
33	155	3540	59:00		Touch	blank	
34	187	3747	1:02:27		Touch	UCS	
35	54	3821	1:03:41		Touch	UCS	
36	42	3883	1:04:43		Touch	blank	
37	60	3963	1:06:03		Touch	UCS	
38	97	4080	1:08:00		Touch	UCS	
39	42	4142	1:09:02		Touch	UCS	
40	89	4251	1:10:51		Touch	blank	
41	35	4306	1:11:46		Touch	blank	
42	69	4395	1:13:15		Touch	UCS	
43	77	4492	1:14:52		Touch	UCS	
44	100	4612	1:16:52		Touch	blank	

Student ID _____   Section _____

Date   _____

Reflex Conditioning
Programming / Data Sheet (Session 2)

Trial #	ITI	Prog Time Sec	Prog Time Min + Sec	Actual Time	Procedure CS	UCS	Rating of Salivation
Start		0	0:00				
1	71	71	1:11		Touch	UCS	
2	58	149	2:29		Touch	blank	
3	38	207	3:27		Touch	UCS	
4	45	272	4:32		Touch	UCS	
5	130	422	7:02		Touch	UCS	
6	89	531	8:51		Touch	blank	
7	81	632	10:32		Touch	blank	
8	63	715	11:55		Touch	UCS	
9	155	890	14:50		Touch	UCS	
10	187	1097	18:17		Touch	blank	
11	54	1171	19:31		Touch	UCS	
12	72	1263	21:03		Touch	UCS	
13	42	1325	22:05		Touch	UCS	
14	97	1442	24:02		Touch	blank	
15	155	1617	26:57		Touch	UCS	
16	89	1726	28:46		Touch	blank	
17	35	1781	29:41		Touch	UCS	
18	69	1870	31:10		Touch	UCS	
19	52	1942	32:22		Touch	UCS	
20	81	2043	34:03		Touch	blank	
21	45	2108	35:08		Touch	UCS	
22	270	2398	39:58		Touch	UCS	
23	75	2493	41:33		Touch	UCS	
24	42	2555	42:35		Touch	blank	
25	76	2651	44:11		Touch	UCS	
26	58	2729	45:29		Touch	blank	
27	38	2787	46:27		Touch	UCS	
28	200	3007	50:07		Touch	UCS	
29	45	3072	51:12		Touch	blank	
30	89	3181	53:01		Touch	UCS	
31	81	3282	54:42		Touch	UCS	
32	63	3365	56:05		Touch	UCS	
33	155	3540	59:00		Touch	blank	
34	187	3747	1:02:27		Touch	UCS	
35	54	3821	1:03:41		Touch	UCS	
36	42	3883	1:04:43		Touch	blank	
37	60	3963	1:06:03		Touch	UCS	
38	97	4080	1:08:00		Touch	UCS	
39	42	4142	1:09:02		Touch	UCS	
40	89	4251	1:10:51		Touch	blank	
41	35	4306	1:11:46		Touch	blank	
42	69	4395	1:13:15		Touch	UCS	
43	77	4492	1:14:52		Touch	UCS	
44	100	4612	1:16:52		Touch	blank	

Student ID _____   Section _____

Date _____

Reflex Extinction
Programming / Data Sheet (Session 3)

Trial #	ITI	Prog Time Sec	Prog Time Min + Sec	Actual Time	Procedure CS	UCS	Rating of Salivation
Start		0	0:00				
1	71	71	1:11		Touch	UCS	
2	58	149	2:29		Touch	UCS	
3	38	207	3:27		Touch	UCS	
4	45	272	4:32		Touch	blank	
5	130	422	7:02		Touch	blank	
6	89	531	8:51		Touch	blank	
7	81	632	10:32		Touch	blank	
8	63	715	11:55		Touch	blank	
9	155	890	14:50		Touch	blank	
10	187	1097	18:17		Touch	blank	
11	54	1171	19:31		Touch	blank	
12	72	1263	21:03		Touch	blank	
13	42	1325	22:05		Touch	blank	
14	97	1442	24:02		Touch	blank	
15	155	1617	26:57		Touch	blank	
16	89	1726	28:46		Touch	blank	
17	35	1781	29:41		Touch	blank	
18	69	1870	31:10		Touch	blank	
19	52	1942	32:22		Touch	blank	
20	81	2043	34:03		Touch	blank	
21	45	2108	35:08		Touch	blank	
22	270	2398	39:58		Touch	blank	
23	75	2493	41:33		Touch	blank	
24	42	2555	42:35		Touch	blank	
25	76	2651	44:11		Touch	blank	
26	58	2729	45:29		Touch	blank	
27	38	2787	46:27		Touch	blank	
28	200	3007	50:07		Touch	blank	
29	45	3072	51:12		Touch	blank	
30	89	3181	53:01		Touch	blank	
31	81	3282	54:42		Touch	blank	
32	63	3365	56:05		Touch	blank	
33	155	3540	59:00		Touch	blank	
34	187	3747	1:02:27		Touch	blank	
35	54	3821	1:03:41		Touch	blank	
36	42	3883	1:04:43		Touch	blank	
37	60	3963	1:06:03		Touch	blank	
38	97	4080	1:08:00		Touch	blank	
39	42	4142	1:09:02		Touch	blank	
40	89	4251	1:10:51		Touch	blank	
41	35	4306	1:11:46		Touch	blank	
42	69	4395	1:13:15		Touch	blank	
43	77	4492	1:14:52		Touch	blank	
44	100	4612	1:16:52		Touch	blank	

You may use the following three figure templates to display your data. Alternatively, you can make your own. Note that the two conditioning session figures have separate functions for UCS trials and blank trials.

Session 1(conditioning)

Experience (trials)

Session 2(stabilization)

Experience (trials)

Extinction

Saliva

10

0

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44

Experience (trials)

Writing Your Research Paper

The following sample paper is a template for your research paper.

You must fill in the blank spaces, write material on your own where indicated, then type, and print out your paper on your own. **It is important that you type for yourself the prewritten sections of your paper because it will provide you with a staged exposure to the final requirements of this course and therefore make the final requirement easier.** You are getting credit for typing your paper yourself.

Do not share the typing responsibility. That is a form of plagiarism and will result in an F for the semester.

You may not work with anyone. Do not discuss your ideas or how you are going to write your paper with anyone. You cannot use as an excuse for unusual similarities with someone else's paper that you talked to them about your paper.

You may not simply copy or paraphrase the instructions given in the lab manual into your paper nor copy or paraphrase from anyone else nor may you copy or paraphrase our own paper from an earlier semester. If you do, it is plagiarism and you will be assigned an F for the semester in this course.

Refer to the "How to Write a Lab Report" section of this manual, or the lab assistants, for additional information on writing a lab report.

The Lab Reports must be typed, stapled, formatted correctly (including being typed double-space with a serif font such as Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point, and neat. You must include your actual cumulative records (or Xerox copies) stapled as a group to the back of the research paper.

Note that you use your student ID number rather than your name.

Observe the sample paper on the bulletin board of the lab to know how your paper should appear. You will lose points if our paper is not formatted correctly.

If you do not have a computer and/or a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you a day or so to learn how to type and print a

paper. A second reason to start early is that you may experience a computer hardware problem that could cause your paper to be late.

Be sure to:
1. Double space and print on only one side of the paper.
2. Fill in all of the blanks in the template or sample paper.
3. Write material on your own where indicated. Do not simply retype the instructions. For example, when it asks for "student ID number," type your student ID number and do not retype "your student ID number."
4. Submit your paper to the Canvas plagiarism site before the beginning of the lab on the day it is due.
5. Hand your lab report directly to the lab assistant before the beginning of the lab on the day it is due.

For sample papers, go to:
APA's website
apastyle.org/manual/related/sample-experiment-paper-1.pdf
or
Purdue University's OWL website
https://owl.purdue.edu

DO NOT CHEAT. You will flunk the course!
You may not copy anyone else's paper (even the typed template from a previous lab or your own paper from a previous semester).

The Canvas Plagiarism Checker will discover you are cheating and you will receive an F for the semester for doing so.

Environmental Control of Involuntary Behavior

_____

(your student ID number)

_____

(your lab section and time)

Jacksonville State University

Abstract

Reflex conditioning was demonstrated by pairing a _____ stimulus (*label for the type of stimulus*) with a _____ stimulus (*label for the type of stimulus*). The UCS was a _____ (*what was used*). The dependent variable was the subjectively-estimated quantity of _____ *(what was measured)* across _____ trials (*how many*) with an intertrial interval of approximately ___ minutes (*how many*). Conditioning trials were followed by 29 extinction trials over the course of three sessions. Data from interspersed blank trials indicated that salivation _____ (*what happened to salivation*). Thus the neutral stimulus became a conditioned stimulus, and the unconditioned response of salivation became the conditioned response. The extinction session displayed _____ (*what happened during extinction trials*). These results are consistent with the findings of Pavlov (_____) (*year*) that indicated that salivation could be _____ _____ (*what was the purpose of the experiment*).

Summarize each of the sections of the report. The abstract begins a new page. It should be short, but informative. The Abstract covers what the original questions were, what the answer was, and the conclusion drawn. Summarize the general procedure and the major findings in not less than 100 nor more than 150 words. This section should contain statements of the problem, method, results and conclusions.
For future reference, example writing points could be:
    Context of research question
    Explicit statement of question
    What and how many subjects used
    How question was answered
    Results of research

Environmental Control of Involuntary Behavior

_____ (*what class of behavior*) are functional

relationships between stimuli and responses where the behavior always occurs if

an eliciting stimulus occurs. The stimulus response connection is hard-wired into

the nervous system. On the other hand, _____ (*a different class of*

behavior) are not hard-wired behaviors to a specific stimulus; they are voluntary.

Pavlov (1927) found that basic reflexes, such as salivation, could be caused to

occur by arbitrary stimuli. In his experiment, Pavlov showed

_____

_____ (*what did Pavlov do in his experiment*).

These findings created a strong interest in the study of reflex conditioning

(Honey, Powell, & Symbaluk, 2013).

Pavlov's finding indicated that a reflex response could be made to occur to

the presence of arbitrary stimuli in addition to its normal eliciting stimulus.

This finding demonstrated that the behavior of lower animals such as dogs

adjusted to the environment. It was not the case that only humans could benefit

by experience with the environment. The behavior of lower animals was not

fixed and actually did exhibit adaptive learning.

How reflexive behaviors adjust to the events in the environment is a

critical dimension of living organisms and will be explored by conditioning

salivation.

> Place some additional material here.

The present experiment was designed to determine if a relatively involuntary behavior such as salivation could be controlled by experience with the contingencies in the environment by _____ _____ .

Method

> The Method section consists of the Subject, Apparatus, and Procedure sections. It tells the reader precisely how the experiment was conducted. Include everything necessary to replicate and obtain the same results and nothing that is unnecessary. Include the relevant; exclude the irrelevant. There is no introduction following the word Method. The first line of the Method section is the title of the Subject's section. The Method section does not begin on a new page.

Subject

> Include how many, what species, the population from which they were selected, and any other pertinent details concerning the subjects in particular (i.e., where they pre-exposed to other experimental procedures). Provide the information necessary to replicate the study with respect to subjects.

Apparatus

> Describe the apparatus sufficiently enough that someone could replicate **your study** with respect to apparatus or setting. Describe the apparatus only insofar as it interacts with the subject. If it was not used, do not describe it. Do not describe the way the apparatus interacts with the experimenter unless it has a direct bearing on the procedure or the results. You must use the Standard International System of Units (metric system). **Make sure to include all materials that were used (i.e., Listerine Pocket Pack breath strips, Q-tip, small container of water, blindfold).**

Procedure

The reader must know **everything that happened to the subject,** that is, all of the information necessary to replicate the study. Procedures are written in terms of a sequence of events. Give an overall view then a detailed description. Include maintenance schedule, how the independent variable was administered, and how the dependent variable was recorded.

Results

In sum, the procedure showed _____

_____ (*did*

conditioning occur or not). Initially the blank trials produced _____

_____ (*what happened*). After the

conditioning procedure which paired touching of the foot with a Listerine strip

on the tongue, salivation _____

_____

_____

_____

_____ (*what happened*).

The first session took approximately _____ minutes with _____

UCS trials (*how many*) and _____ blank trials (*how many*). The amount of

salivation was initially _____. This indicated that

_____ (*did*

conditioning occur).

Figure 1 shows the increase in salivation to the foot touch to each blank trial over the two conditioning sessions. The *x*-axis depicts increasing experience while the *y*-axis indicates amount of salivation.

The second session also took approximately _____ minutes with _____ UCS trials (*how many*) and _____blank trials(*how many*). The salivation rating during the blank trials indicated _____; (*what happened*) because _____

_____ (*why did this happen*).

Figure 2 depicts the change in salivation to each consecutive blank trial across the extinction procedure. It shows that _____

_____

_____ (*what happened to salivation*).

First briefly present the main trend of the findings with respect to the main procedural manipulation. Then logically present the relevant results of the procedure. Order your presentation with respect to categories of results. Summarize your data, avoid presenting raw data. Present or show data to justify your assessment of the major trends. You MUST prove your points and not just state them. Provide quantitative measures. Present evidence supporting the reliability of the data, and the amount of variance your descriptions will account for. Additionally provide information, which will allow the reader to realize the magnitude of the effect, which would be necessary before it was reported as reliable. Do not introduce theory or interpretations in this section. This is a data section. Keep in mind that your topic is Psychology and that the behavior of the organism (not the organism itself) is the dependent measure. Describe the behavior, not the organism. A handy rule of thumb is "you should avoid altogether any reference to the subject (the organism) in the results and discussion sections. For example, "the response rate increased ...." rather than "the pigeon pecked faster".

Discussion

The present experiment demonstrated the effects of _____

conditioning (*type of conditioning*). It was found that _____

_____

_____ (*what did results show*).

These findings suggest that an involuntary response can be controlled by

arbitrary stimuli as the result of exposure to _____

_____ (*what did your findings show*).

This is important to note when dealing with irrational fears or phobias.

By understanding the process of reflex conditioning, how subtle stimuli can come

to control involuntary behavior, and the extinction of such reflexes, one can then

control the reflex, by pairing or unpairing the response to specific stimuli. This

would have the impact of _____

_____

(*what would happen?*)

The Discussion section answers the question "SO WHAT?" or "WHAT OF IT?" It discusses what the results of the research mean. Open this section with a clear statement of support or lack of support of the original hypothesis presented in the Introduction. Recap data to prove the answer to the question regardless of whether they were affirmative or negative. Discuss how your findings are similar to other kinds of things. Help substantiate your conclusions by pointing out similarities and the relevance to your conclusions. The data will answer some questions more than others. Make partial conclusions. State the limitations, qualifications, and generalizations of your statements. Use "but" and "however" type sentences, e.g., "these data suggest this, however, such and such may not have been controlled."

This section is your conclusion and not your results. It is what you think about your results and what they mean, not just a repeat of the results section. Remember that your data are real and not hypothetical. It is assumed that you have thought about the ramifications and implications of your research more than anyone else, however never be final or eternal about your conclusions. Never end a discussion with an appeal for more research to be done.

References

Honey, P. L., Powell, R. A., & Symbaluk, D. G. (2013). *Introduction to Learning and Behavior: Fourth Edition.* Belmont, CA: Wadsworth, Cengage Learning.

NOTE: Don't Forget the Pavlov (1927) reference. Include all other references used.

All references must be written in APA format. Examples of APA referencing can be found in your lab manual, previous references sections of other lab reports, or at www.apa.org.

Any paper or article used and not cited is plagiarism! You must reference all your information sources.

Session 1(conditioning)

Experience (trials)

Session 2(stabilization)

Experience (trials)
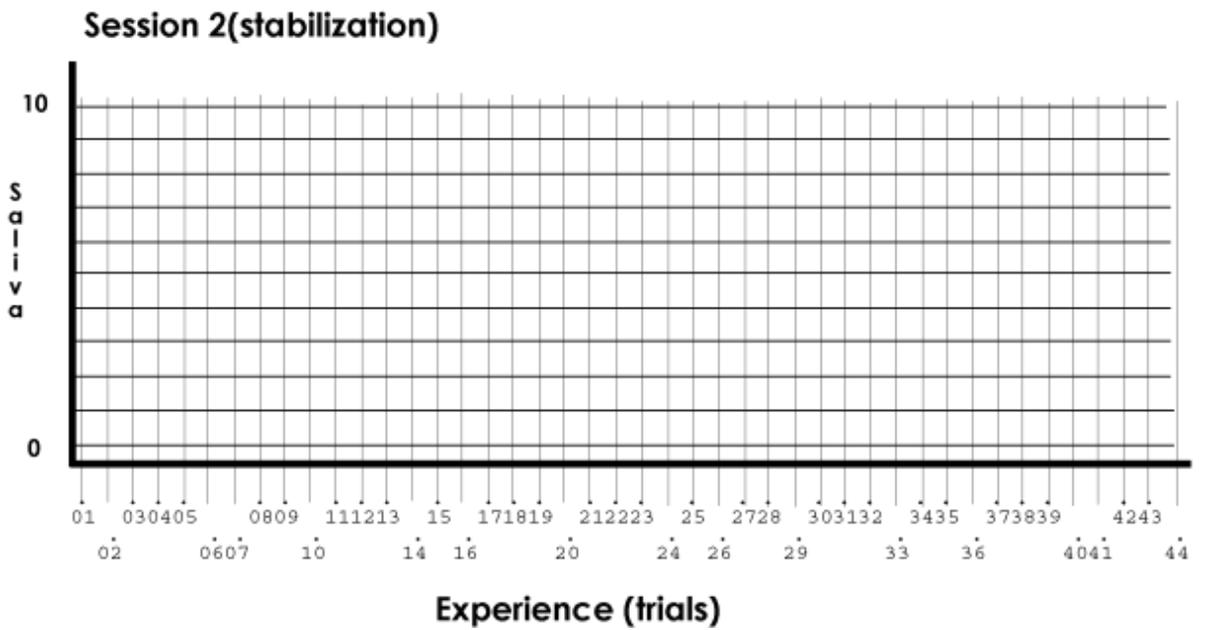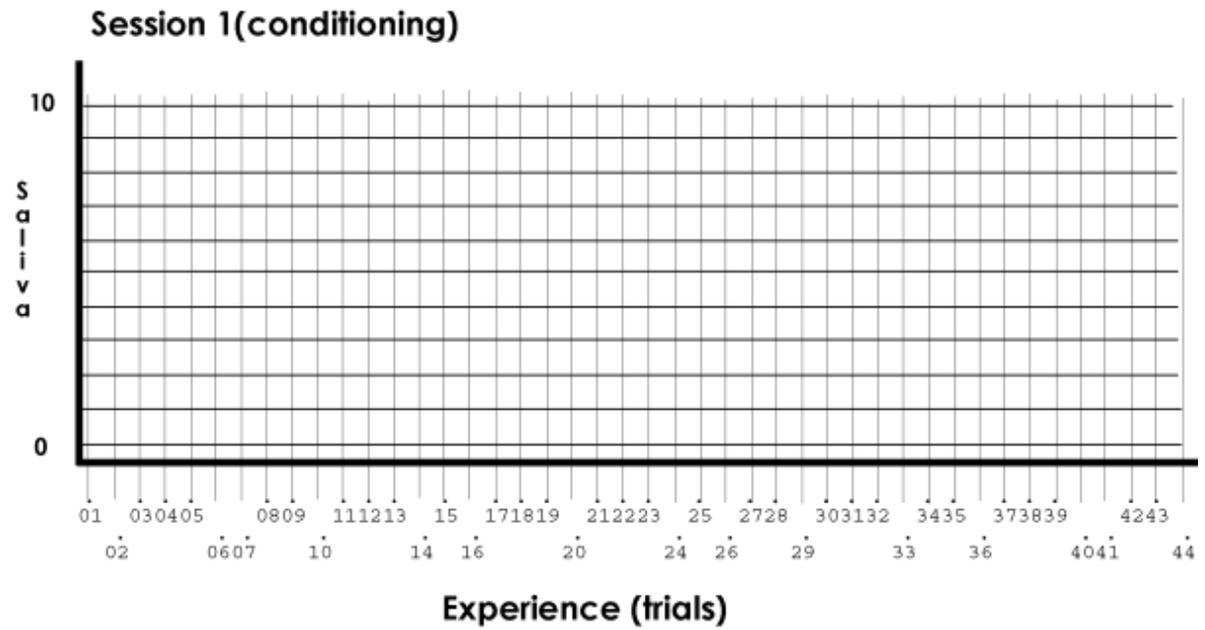
Figure 1. The upper and lower figures depict the amount of salivation to each of

the 44 trials of Session 1 and Session 2. The y-axis indicates the amount of

salivation indexed from 0 to 10. The UCS was presented on the trials indicated

in the upper row of the x-axis. Blank trials occurred on the trials indicated in the

lower row of the x-axis.

Generate this figure including your data.

Extinction

Experience (trials)
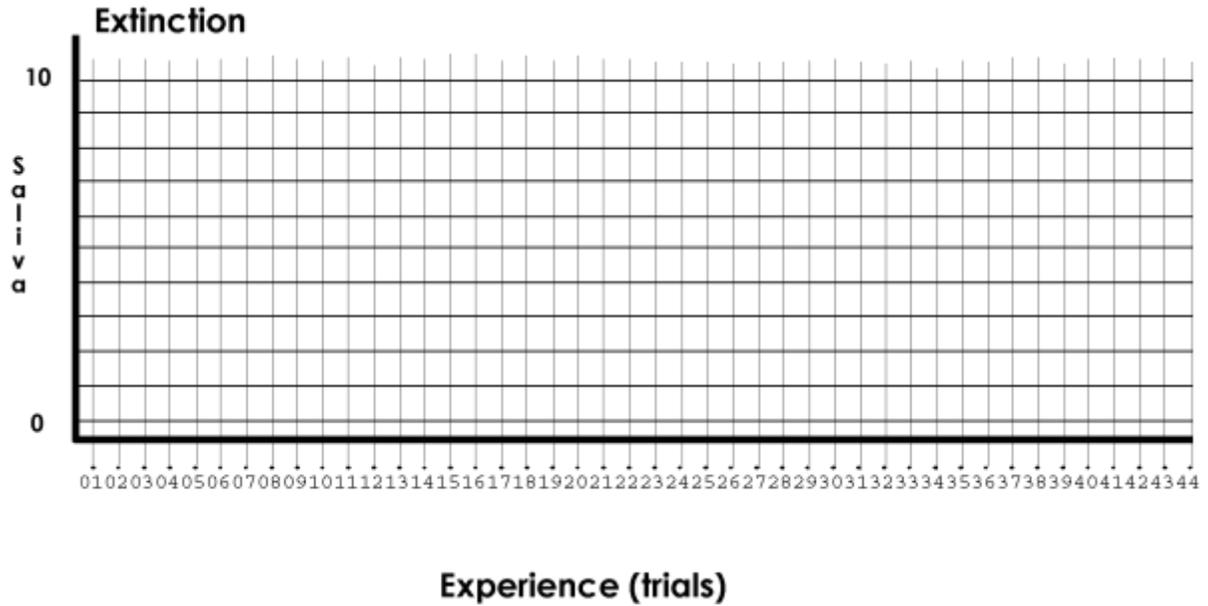
Figure 2. Reported salivation as a function of successive extinction trials

following three UCS trials. _____

_____

_____

Generate this figure using this template (or your own) including your data.

EXPERIMENT 4

Stimulus Control: The Control of Response Patterning by Explicit Stimuli and Changes in the Probability of Reinforcement

If you implement a multiple FI VI schedule, you will prove to yourself that behavior is appropriate to the changes in the probability of reinforcement signaled by the stimuli in the environment. Moment-to-moment subtle changes in the probability of reinforcement will control subtle moment-to-moment changes in the behavior. global changes in reinforcement signaled by global changes in stimuli will control global changes in behavior.

Two levels of stimulus control are illustrate in this experiment. Subtle changes in the moment-to-moment probability of reinforcement will control subtle changes in the moment-to-moment behavior within each of two different schedules of reinforcement. The very different overall global behavior pattern in the two schedules of reinforcement will be controlled by the different key colors signally those different reinforcement schedules.

The previous operant conditioning lab exercises allowed you to see for yourself:
1. The effects of a Thorndikian reinforcement contingency.
2. The effects of removing a reinforcement contingency.
3. That reinforcers can be effective even when intermittent.
4. The sensitivity of behavior to the immediate context of reinforcement.
   which is to say behavior occurs in the situation in which it was reinforced and tends not to occur in situations in which it was not reinforced.

In this lab, you will prove for yourself that behavior differs when even slight details of the context of reinforcement change even though on average things are the same. In order to best observe how two different contexts control two different behaviors, you will switch back and forth during the session between two different schedules and get many samples of what happens with each context of reinforcement to compare. This procedure is labeled a multiple schedule.

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Whenever the keylight is red, a peck will be reinforced on the average of every 60 seconds but it will occur **after many different intervals preceding the reinforced peck** (a variable-interval 60-sec schedule). Sometimes a peck will be reinforced in the presence of only a short delay from the prior reinforcement while at other times the delay may be a medium or long time since the prior reinforcer, but reinforcement always occurs on average after 60 seconds.

When the keylight is green, a peck will also be reinforced on the average of every 60 seconds, but in this case **a reinforced peck will occur only and always in the context of 60 seconds having passed since the previous food** (a fixed-interval 60-sec schedule). A peck will never be reinforced after a short delay and it will always be reinforced after a delay of 60 seconds. The overall frequency of reinforcement is exactly the same in the two schedules, only the variability of the context of reinforcement differs.

The formal names for these two schedules are a variable interval 60 second schedule (VI 60-sec) and a fixed interval 60 second schedule (FI 60-sec). The multiple schedule will make it easy for you to see that the behavior during the two schedules becomes quite different. Any difference in the behavior to the two schedules must be the immediate context of reinforcement because overall your pigeon gets the same amount of food per hour under both schedules. You will be able to prove for yourself that the precise aspects of the context preceding reinforcement have a reliable and different effect on behavior.

A second important phenomenon you will prove for yourself is that living organisms can discriminate between things. They can behave one way under one stimulus condition and behave in a very different way under different stimulus conditions if the reinforcement contingencies are different in those two different stimulus conditions.

Take Home Message Demonstrated by This Lab
1. the local stimuli preceding reinforcement governs the pattern of behavior, and if reinforcers occur at any time, then responding will occur at any time; if reinforcers occur only after a fixed delay, then behavior will occur mostly after that delay.
2. the general contextual stimuli (the key color) can come to reliably control completely different patterns of behavior if they signal differences in the characteristics of the schedule of reinforcement.

Both are cases of discriminative control over behavior.

Experiment 4 Time Lines

1. Establish VI 60-sec
2. Stabilize VI 60-sec
3. Establish Multiple VI 60-sec FI 60-sec
4. Multiple VI 60-sec FI 60-sec stability
5. Multiple VI 60-sec FI 60-sec stability
6. Multiple VI 60-sec FI 60-sec stability

Write-up of Lab 4 Due at the beginning of the lab period on ^^Monday, November 4, 2020.

I.   Task: Establish Control by a Variable-Interval Schedule

As a first step in this lab, you are to establish control over key pecking with a variable-interval (VI) schedule. In a VI schedule, **a peck may be reinforced at almost any time, rather than only after a fixed number of prior pecks**. With a VI schedule, the peck may be reinforced in the context of 8 seconds since the last reinforcer or the peck may be reinforced after 240 seconds, or the peck may be reinforced after 125 seconds, or after 28 seconds. There is no way to predict. Note that the number of prior pecks is irrelevant. Time is the context of the reinforced peck rather than response count. The peck is reinforced if 8 seconds have passed not if 8 pecks have occurred. It doesn't matter if a million or no pecks have preceded the reinforced peck: only the time matters. It's rather like getting e-mail (without a "you've got mail" signal). You may have a message in a few seconds after checking your e-mail, after 10 minutes, after 6 hours and 13 minutes, or after 1 hour and 37 seconds – there is no way of knowing. The only way to tell if you have a message on your computer is to check your e-mail every so often; the more often you check, the less the delay between the arrival of the message and when you can read it. But only one look is necessary; it's just that the only look that counts is the first time you look after the message arrives. If the person sending the mail doesn't send it until 3 hours, 7 minutes, and 12 seconds after you last checked your e-mail, you could check once after 3 hours 7 minutes and 12 seconds, or you could check your e-mail every 5 seconds for the entire 3 hours 7 minutes and 12 seconds. You would still not get your message until 3 hours 7 minutes and 12 seconds elapsed.

A fixed-interval schedule, on the other hand, is like getting letter through the regular postal service when the mailman only and always comes at 2:00 in the afternoon (and you don't have a watch). Looking to see if you have mail at 10:00 AM is a waste. Checking at 9, then 10, then 11, and then 12 is also a waste of time. None will be rewarded. But as 2:00 PM comes closer and closer, you are likely to check your mailbox with increasing frequency. **Both fixed-interval and variable-interval schedules reinforce a peck. The pigeon must peck in order for food to occur.** Both email and regular mail require that you check to see if you have mail.

Apparatus Preparation

If you are at the beginning of a session

1. Fill in the first section of your daily data sheet

2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Multiple Schedule: Manual** by pressing **Schedule Select**. Assure that the word **Manual** is on the display. Otherwise the controller will not operate correctly. There are two different multiple schedules.
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* Mode** if necessary.

Procedure: *Implementing a VI Schedule*

Note that the red light above the left of the lower two buttons on the control computer is on. This information will be important later in the experiment when you switch back and forth between two different schedules. The left light indicates you are in Schedule 1 (red key light and VI schedule).

Use the programming sheet labeled "Variable Interval Schedule" that is at the end of this experiment. The time delay you will require for each consecutive reinforcer is listed on each consecutive line. On average, the bird will get reinforced every 60 seconds. Observe the programming sheet. The first trial specifies that the keylight should be red and that the first response after 28 seconds should be reinforced. Watch the trial time counter in your data display window. (The time from the end of one reinforcer to the start of the next reinforcer is labeled a "trial.") It will be incrementing up from the time you turned the controller on. When it reaches 28 seconds, press the left **S* Activate** button. The first peck after 28 seconds will then be reinforced automatically, regardless of whether the peck occurs immediately or only after 10 minutes.

Next the first response after 8 seconds should then be reinforced. You should therefore press the **S* Activate** button when the trial time reaches 8 seconds. Continue through the programming sheet until your pigeon receives the number of reinforcers that maintains it at its 80% weight.

Note that the bird can peck or not peck throughout most of the trial and it is totally irrelevant. Only one peck is required (and is necessary) for reinforcement. Again, this is much like the times you check your e-mail throughout the day.

Before an e-mail arrives, you may not check it at all or you can check it a million times. It is only the first time you check it after the mail arrives that counts. Note also that it is time that governs when a response will be reinforced not a response count. Checking your e-mail a greater or lesser number of times has no effect on making the e-mail arrive any sooner. Finally, note that even though only one peck is required, the bird will constantly peck because when the peck will payoff is totally unpredictable and that pecks following almost any amount of time have been reinforced, therefore the bird will constantly peck, just as you would constantly check for a very very important email.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet. Note that you will have to scroll the window down with the down arrow below our display screen.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Record your final data from your data display at the end of the session.

Criterion to Proceed

* Proceed to next task at the beginning of the second session.

II. Task: Establish Control by a Multiple VI FI Schedule

Overview: *Implementing a multiple VI FI schedule*

In a multiple schedule, you will unpredictably alternate back and forth between two different schedules; in this case, schedules with the same average reinforcement rate. You will signal to the pigeon which schedule is in effect by the key color. The red keylight will signal that the VI or variable schedule is in effect, while a green keylight will signal that the regularly occurring reinforcement pattern or an FI schedule is in effect. The schedules are switched when you press the **Schedule Select** button at the top of the control computer while the reinforcement hopper is raised. **Note! The Schedule Select button will work only if you press it while the reinforcement magazine is up.** The reason the computer works this way is so that you cannot accidentally change the schedule while your bird is pecking.

When the schedule starts, the pigeon key is red and the schedule contingency is controlled by the left set of reinforcement buttons on the control computer as indicated by the little red light above the left set of reinforcement buttons. When you change schedules with the **Schedule Select** button, the key color changes to green, and reinforcement is then controlled by the right set of reinforcement buttons on the control computer as indicated by the little red light above the right set of reinforcement buttons. The data are automatically recorded in different counters by the computer. There are two different Run Data displays. The control computer automatically switches between them. Note the illustrations with the description of the control computer on page 39 and the display information on pages 46 through 48. It is important to re-read that information at this time.

Both schedules will be implemented in the same way you were implementing the VI schedule in the last task. When the time specified for that particular trial on the programming sheet elapses, press the appropriate **S* Activate** button. If the left Schedule 1 red light is illuminated on the control computer, then the schedule is a VI and the pigeon key is red. If the right Schedule 2 red light is illuminated on the control computer, then the schedule is an FI and the pigeon key is green. Simply watch the trial time in the data window and when it reaches the time specified in the programming sheet, press the appropriate (right or left) **S* Activate** button on the control computer.

If the upcoming trial indicates that the key color (and schedule) is different than the previous trial, then change the key color and schedule while the bird is eating by pressing the **Schedule Select** button at the top of the control computer during reinforcement. This will automatically switch the schedule and change the keylights.

<u>Practice</u> Implementing a multiple VI FI schedule

You must do this practice session before proceeding to run your bird on a multiple schedule.

Apparatus Preparation

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Multiple Schedule: Manual** by pressing **Schedule Select.**
6. Assure that the little green light is **off** – press **S* Mode** if necessary.
7. Turn the cumulative recorder paper drive switch on (up).
8. Carefully remove the pen caps.

Do <u>not</u> put your pigeon in the chamber yet.

For example, observe the first trial on the programming sheet labeled practice multiple VI FI schedule. The sheet specifies that when you turn on the apparatus, the key light will be red. Press **Start** and lightly peck on the pigeon key about once every 5 seconds with your finger throughout this practice session. Press the left **S* Activate** button when the trial time in the display window equals 10 seconds (i.e., the trial time equals 10). The key color remains the same for the next trial. Press the **S* Activate** button after 3 seconds (i.e., the trial time equals 3). The third trial calls for a green light, so push in the **Schedule Select** button while the bird would be eating (this will be the second time the bird would have eaten during this session). Pressing this button will change the schedule. When reinforcement terminates, you will notice that when the key comes on again, the key color is now green. The FI schedule is to be in effect when the light is green. After 10 seconds (i.e., when the trial time equals 10 seconds), press the right **S* Activate** button. The next two trials also provide a reinforcer following the first peck after 10 seconds. Press the **Schedule Select** button while the food hopper is operated whenever your Data Programming sheet indicates that the upcoming trial is a different schedule than the trial that just ended. Continue working through the practice programming sheet until the end of the practice trials.

<u>Actual</u> Implementation of a multiple VI FI schedule

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Multiple Schedule: Manual** by pressing **Schedule Select.**
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weight it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* Mode** if necessary.

By following the instructions on the multiple VI FI programming sheet on page 279 you will go back and forth between a variable interval 60-sec schedule and a fixed interval 60-sec schedule. You will be able to see for yourself if something as seemingly simple as the variability in the timing of the reinforcer has an effect on the behavior of a real live organism. Only the variability is different between the two schedules. The reinforcement rate of both schedules is 60 reinforcers per hour.

You must do this multiple VI FI schedule for at least 5 sessions (if you only want to work 2 days a week). However, the more sessions you run, the more validly you will document the behavior controlled by these schedules. If you want to get more stable data, you can run this procedure for as many as 12 sessions. If you want to work the maximum of 5 days a week (you will receive extra credit for the extra work).

Use your controller to time the trials. Do not use your cell phone. You are forbidden to have your cell phone out or even on.

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.

5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Performance to be Expected: Steady State (VI FI)

Student: Session
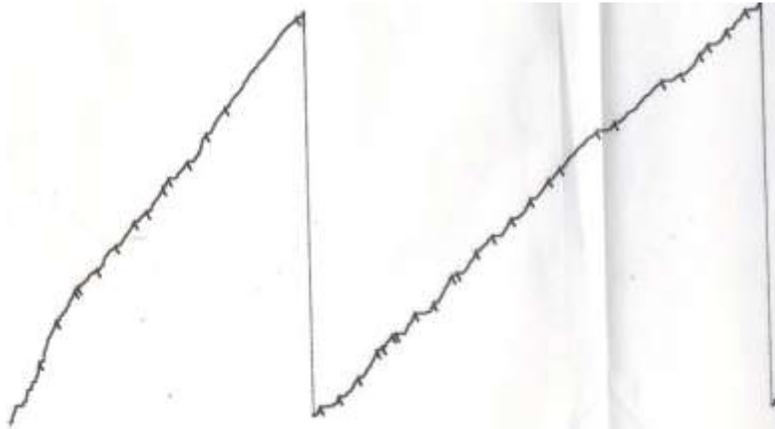
Student: Local
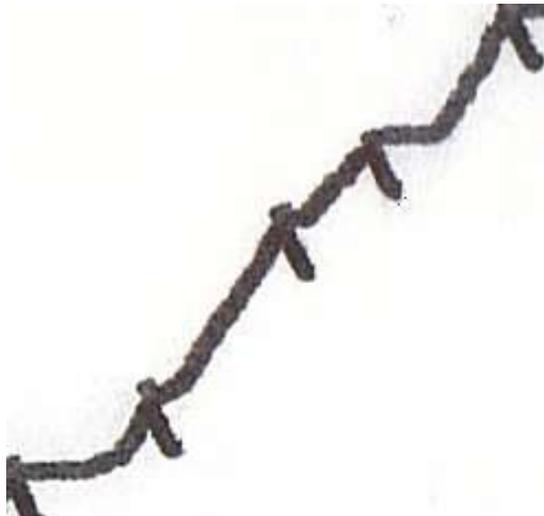
Criterion to Proceed

* Proceed to the next experiment when you finish at least 5 sessions of a multiple VI FI and you have the lab assistant's approval.

Data/Programming Sheets

Practice
Experiment 4 Programming Sheet
Multiple VI FI Schedule

Trial	Key Color	Time (Sec)
1	red	10 s
2	red	3 s
3	green	5 s
4	green	5 s
5	green	5 s
6	red	2 s
7	green	5 s
8	green	5 s
9	red	7 s
10	red	2 s
11	red	9 s

Experiment 4 Programming Sheet
Variable-Interval Schedule

Trial	Key Color	Time (Sec)	Time (Min & sec)		Trial	Key Color	Time (Sec)	Time (Min & sec)
1	red	28 s	28 s		36	red	51 s	51 s
2	red	8 s	8 s		37	red	15 s	15 s
3	red	15 s	15 s		38	red	240 s	4 min
4	red	59 s	59 s		39	red	45 s	45 s
5	red	51 s	51 s		40	red	12 s	12 s
6	red	33 s	33 s		41	red	28 s	28 s
7	red	125 s	2 m 5 s		42	red	8 s	8 s
8	red	157 s	2 m 37 s		43	red	15 s	15 s
9	red	24 s	24 s		44	red	59 s	59 s
10	red	12 s	12 s		45	red	51 s	51 s
11	red	67 s	1 m 7 s		46	red	33 s	33 s
12	red	125 s	2 m 5 s		47	red	125 s	2 m 5 s
13	red	59 s	59 s		48	red	157 s	2 m 37 s
14	red	5 s	5 s		49	red	24 s	24 s
15	red	39 s	39 s		50	red	12 s	12 s
16	red	51 s	51 s		51	red	67 s	1 m 7 s
17	red	15 s	15 s		52	red	125 s	2 m 5 s
18	red	240 s	4 min		53	red	59 s	59 s
19	red	45 s	45 s		54	red	5 s	5 s
20	red	12 s	12 s		55	red	39 s	39 s
21	red	28 s	28 s		56	red	51 s	51 s
22	red	8 s	8 s		57	red	15 s	15 s
23	red	15 s	15 s		58	red	240 s	4 min
24	red	59 s	59 s		59	red	45 s	45 s
25	red	51 s	51 s		60	red	12 s	12 s
26	red	33 s	33 s		61	red	28 s	28 s
27	red	125 s	2 m 5 s		62	red	8 s	8 s
28	red	157 s	2 m 37 s		63	red	15 s	15 s
29	red	24 s	24 s		64	red	59 s	59 s
30	red	12 s	12 s		65	red	51 s	51 s
31	red	67 s	1 m 7 s		66	red	33 s	33 s
32	red	125 s	2 m 5 s		67	red	125 s	2 m 5 s
33	red	59 s	59 s		68	red	157 s	2 m 37 s
34	red	5 s	5 s		69	red	24 s	24 s
35	red	39 s	39 s		70	red	12 s	12 s

Experiment 4 Programming Sheet
Multiple VI FI Schedule

Trial	Key Color	Time (Sec)	Time (Min & sec)		Trial	Key Color	Time (Sec)	Time (Min & sec)
1	red	28 s	28 s		36	green	60 s	60 s
2	red	8 s	8 s		37	red	240 s	4 m
3	green	60 s	60 s		38	red	45 s	45 s
4	green	60 s	60 s		39	green	60 s	60 s
5	green	60 s	60 s		40	green	60 s	60 s
6	red	15 s	15 s		41	green	60 s	60 s
7	green	60 s	60 s		42	red	12 s	12 s
8	green	60 s	60 s		43	red	28 s	28 s
9	red	59 s	59 s		44	red	8 s	8 s
10	red	51 s	51 s		45	green	60 s	60 s
11	red	33 s	33 s		46	green	60 s	60 s
12	green	60 s	60 s		47	green	60 s	60 s
13	green	60 s	60 s		48	red	15 s	15 s
14	red	125 s	2 m 5 s		49	red	59 s	59 s
15	red	157 s	2 m 37 s		50	red	51 s	51 s
16	green	60 s	60 s		51	green	60 s	60 s
17	green	60 s	60 s		52	green	60 s	60 s
18	green	60 s	60 s		53	green	60 s	60 s
19	red	24 s	24 s		54	red	33 s	33 s
20	red	12 s	12 s		55	red	125 s	2 m 5 s
21	green	60 s	60 s		56	green	60 s	60 s
22	green	60 s	60 s		57	red	157 s	2 m 37 s
23	red	67 s	67 s		58	green	60 s	60 s
24	red	125 s	2 m 5 s		59	green	60 s	60 s
25	green	60 s	60 s		60	red	24 s	24 s
26	red	59 s	59 s		61	green	60 s	60 s
27	red	5 s	5 s		62	green	60 s	60 s
28	green	60 s	60 s		63	green	60 s	60 s
29	green	60 s	60 s		64	red	12 s	12 s
30	green	60 s	60 s		65	green	60 s	60 s
31	red	39 s	39 s		66	green	60 s	60 s
32	red	51 s	51 s		67	green	60 s	60 s
33	red	15 s	15 s		68	red	67 s	1 m 7 s
34	green	60 s	60 s		69	red	125 s	2 m 5 s
35	green	60 s	60 s		70	red	59 s	59 s

Writing Your Research Paper

The following sample paper is a template for your research paper.

You must fill in the blank spaces, write material on your own where indicated, then type, and print out your paper on your own. **It is important that you type for yourself the prewritten sections of your paper because it will provide you with a staged exposure to the final requirements of this course and therefore make the final requirement easier.** You are getting credit for typing your paper yourself.

Do not share the typing responsibility. That is a form of plagiarism and will result in an F for the semester.

You may not work with anyone. Do not discuss your ideas or how you are going to write your paper with anyone. You cannot use as an excuse for unusual similarities with someone else's paper that you talked to them about your paper.

Refer to the "How to Write a Lab Report" section of this manual, or the lab assistants, for additional information on writing a lab report.

The Lab Reports must be typed, stapled, formatted correctly (including being typed double-space with a serif font such as Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point, and neat. You must include your actual cumulative records (or Xerox copies) stapled as a group to the back of the research paper.

Note that you use your student ID number rather than your name.

Observe the sample paper on the bulletin board of the lab to know how your paper should appear. You will lose points if our paper is not formatted correctly.

If you do not have a computer and/or a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you a day or so to learn how to type and print a paper. A second reason to start early is that you may experience a computer hardware problem that could cause your paper to be late.

Be sure to:
1. Double space and print on only one side of the paper.

2. Fill in all of the blanks in the template or sample paper.
3. Write material on your own where indicated. Do not simply retype the instructions. For example, when it asks for "your Student ID number," type your Student ID number and do not retype "your Student ID number."
4. Submit your paper to the Canvas plagiarism site, TurnItIn, before the beginning of the lab on the day it is due.
5. Hand your lab report directly to the lab assistant before the beginning of the lab on the day it is due.

For sample papers, go to:

APA's website

apastyle.org/manual/related/sample-experiment-paper-1.pdf

or

Purdue University's OWL website

https://owl.purdue.edu

DO NOT CHEAT. You will flunk the course!

You may not copy anyone else's paper (even the typed template from a previous lab or your own paper from a previous semester).

The Canvas Plagiarism Checker will discover you are cheating and you will receive an F for the semester for doing so.

The Control of Behavior by Changes in the Probability of Reinforcement

_____

(your Student ID Number)

_____

(your lab section and time)

Jacksonville State University

Abstract

Write an abstract for Experiment 4 that summarizes each section of your paper
.

In the Abstract, you basically summarize each of the sections of the report. The Abstract begins a new page. It should be short, but informative. It should be self-contained. The Abstract covers what the original questions were, what the answer was, and the conclusion drawn. Summarize the general procedure and the major findings with 100-150 words. In summary, this section should contain statements of the problem, method, results, and conclusions.

Example writing points could be:

Context of research question
Explicit statement of question
What and how many subjects were used
Results of research
Implication of results

The Control of Behavior by Changes in the Probability of Reinforcement

An intermittent schedule is one in which _____

_____ (*what is typical in an*

intermittent schedule). An interval-based intermittent schedule specifies

_____ (*what does it specify?*). Variable-

interval (VI) and fixed-interval (FI) schedules enforce different stimulus

conditions at the moment of reinforcement even though they both can provide

overall identical rates of reinforcement. As a result VI and FI schedules produce

very specific and characteristic types of behaviors. These behaviors are

predictable given the context of reinforcement.

The pattern of behavior maintained by a VI schedule _____

_____

_____ (*how does it change*). A VI schedule produces

_____ rate of responding (*what is the speed of responding*). After

reinforcement, there is little to no pre-run pause. Graphically, the behavior

produced by a VI schedule on a cumulative recorder is _____

_____ (*what does a cumulative*

record of a VI look like?). Because of this steady response rate and little to no pre-

run pause, behavior is always likely when maintained on a VI schedule.

An FI schedule, on the other hand, results in _____

_____ (*rate of responding*). An

FI schedule often results in a _____ (*typical pattern of FI*) pattern of

responding on a cumulative recorder. After reinforcement, there is a relatively

prolonged pre-run pause (Honey, Powell, & Symbaluk, 2013). A scalloped

response rate occurs because _____

_____ (*why does the scallop occur*).

The present experiment documented these differences by _____

_____

_____ (*how did the experiment show differences between the two*).

For the introduction, you should talk about how the rate of behavior is increased by reinforcement. Then develop the position that the context of that reinforcement is important because that is how behavior adjusts and becomes optimized to different situations. The context of reinforcement set by a variable-interval schedule and by a fixed-interval schedule are quite different and explain why the behavior is different to these two schedules. Try to find references that talk about those issues and try to develop the history of that thought or that research. You need not be exhaustive and you need not totally understand every nuance of every one of the papers or internet hits you peruse, but you should write about only what you do understand. Then discuss why the procedure you are going to use will be a good one to accomplish your aims. You can also find answers to these methodology questions on the web. As always, you don't need to be perfect, but you do need to do the best you can.

Method

Write the Method section for Experiment 4

Subject

Apparatus

Procedure

Results

Write the Results section for Experiment 4

First summarize your general findings in their actual instantiation (pecks and schedules); then show figures (Xerox copies of cumulative records) or construct figures to illustrate your points.

Show the initial record when the bird first started on the schedule and a final record when the bird had substantial experience with the schedule. Then point out and describe how the behavior changed as the bird got more experience with the schedules. Put numbered arrows on you cumulative record figure to draw attention to particular portions of the record.

Discussion

This experiment focused on the differences in the overall and local rate of

responding between a _____ (*what schedule*) schedule and an _____ (*what schedule*)

schedule. The general findings suggested _____

_____

_____ (*what did the experiment show*).
It is an important illustration that the context, or schedule of reinforcement is
what determines behavior.

The implications of these findings are _____

_____

In an applied setting, the value of this finding _____

_____

_____

(*how could the knowledge you gained in this experiment be used in the "real world?"*)

First summarize the results in their general or conceptual or theoretical instantiation (stimulus classes and behavior). Talk about the importance of your finding. Why is it important to help us understand behavior in general? Then provide a concrete example to illustrate it in everyday life and discuss the example.

References

Honey, P. L., Powell, R. A., & Symbaluk, D. G. _____

_____.

Include any references that appear in your paper in APA format.

Any paper or article used and not cited is plagiarism! You must reference all your information sources.

Figure 1.

Insert or Xerox initial cumulative record (only one session per page).

Write a figure caption for each figure. Describe the layout of figures you are using so someone can understand them.

Figure 2.

Determine what you need to do here for Figure 2.

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Wednesday, ^^Feb. 26, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____	ad lib
_____	85% weight
_____	80% weight
_____	75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Monday, ^^March 2, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____   ad lib
_____   85% weight
_____   80% weight
_____   75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____ Experiment # _____ Session # _____

Date: Wednesday, ^^March 4, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

  Tare scale? ☐

Before session weight _____

  Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # ____   Session # _____

Date: Monday, ^^ March 9, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____   ad lib
_____   85% weight
_____   80% weight
_____   75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Wednesday, ^^March 11, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____
_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____ Experiment # _____ Session # _____

Date: Monday, ^^March 16, 2020

Lab Assistant's Initials Here
Proceed OK _____ Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

* * * Important Note * * *

You will be working on Experiment 5 and Experiment 6 at the same time.

Experiment 5 will be worked on as homework. You may do the lab wherever and whenever you wish, including at home or in the lab at some time you are not running your pigeon.

Experiment 6 will be worked on during your scheduled lab days in the lab.

Time Lines

Experiment 5 should take approximately 4, one-hour sessions.
Lab Report 5 is due ^^**April 13, 2020.**

Experiment 6 should take approximately 7 days of one hour each.
Lab Report 6 is due ^^**April 20, 2020.**

The recommended plan is to get started with Experiment 6 over the first few days. When you are comfortable with that task, get together with your lab partner someplace convenient and carry out Experiment 5 collecting the data for the experiment should take 4 days of approximately 1 hour each. Note that you will be unable to get conditioning if you try to do the lab in one night or if you do not wait the required time between each trial.

EXPERIMENT 5

Differential Reflex Conditioning

If you generate differential reflex conditioning, you will prove to yourself how we come to have very different complex emotions and feelings to subtlety different stimuli.

The previous <u>Thorndikian</u> conditioning lab exercises allowed you to see for yourself:

1. the effects of a Thorndikian reinforcement contingency
2. the effects of removing a reinforcement contingency
3. that reinforcement can be effective even if intermittent
4. the immediate context of reinforcement importantly governs the patterning of behavior

The previous <u>Pavlovian</u> conditioning lab exercises allowed you to see for yourself:

1. innate behaviors such as salivation can come to be controlled by completely new and arbitrary stimuli through Pavlovian conditioning procedures

Recall that the behavior of an organism can be divided into respondents and operants and that these behavior types can come to occur as the result of conditioning in addition to their normal causation. This lab provides you experience with an example of how reflex conditioning can come to occur or not based on very subtle stimuli.

Experiment 3 allowed you to demonstrate to yourself that an arbitrary stimulus can be made to control a reflexive behavior by presenting that stimulus immediately before a stimulus that elicits a reflexive response. You now understand the process whereby we come to have emotional responses to things, even though we may not be "aware" of them and cannot voluntarily control those behaviors. The simple fact is we cannot wake up some morning and decide to truly love an arbitrary person or be phobic of an arbitrary thing just because we "want"

to or that we will get $100.00 for it. However, our learning experiences easily and irresistibly create those exact emotions to particular things.

Experiment 5 allows you to prove for yourself that reflexes can be different to subtly different stimuli. For example, someone may be phobic of red clowns, but be attracted to red clowns that move.

In this lab you will prove to yourself that even reflexive behavior can come under differential control just as you proved with operant conditioning. That is to say, the reflexive behavior will occur to one arbitrary stimulus and will not occur to a very similar but different stimulus (i.e., a discrimination).

Experiment 5 is basically the same as Experiment 3. However, Experiment 5 uses one stimulus to precede trials with the breath strip UCS and a different but similar stimulus preceding interspersed trials that are not paired with the UCS. As you will prove, the arbitrary stimulus preceding the UCS will come to control salivation while the similar arbitrary stimulus that consistently precedes the absence of a UCS will fail to elicit salivation.

The take home message demonstrated by this lab
Very subtle differences in everyday stimuli can control large differences in our feelings and emotions.

Experiment 5 Time Line
1. Establish differential conditioning (approximately 1 hour)
2. Stabilize differential conditioning (approximately 1 hour)
3. Stabilize differential conditioning (approximately 1 hour)
4. Stabilize differential conditioning (approximately 1 hour)

Write-up of Lab 5 Due at the beginning of the lab period on ^^November 20, 2020.

I. Task: Differential Conditioning a Reflex

Subject

The lab group member who was not the experimenter for Lab Exercise 3 will now be the experimenter for this lab. Alternatively, you can use your friend again. If you use the same person as was conditioned in Lab 3 be sure to use whichever foot you touched in Lab 3 as a positive CS, as the negative stimulus in this lab or the stimulus that signals no UCS in this experiment.

Apparatus

1 Listerine Pocket Pack Breath Strips

1 pair of scissors

1 Q-tip cotton swab

1 small paper cup of water

1 paper plate

1 digital watch or timer

1 blindfold

1 pair of latex gloves (if desired)

1 device that will play music for more than 90 minutes

Apparatus Preparation

Cut 12 breath strips into quarters and place them onto the paper plate.

Place the paper cup of water next to the plate.

Place the Q-tip on the paper plate.

Procedure Overview

Read this entire overview, do the practice procedure, then read the step-by-step instructions for the actual lab before starting the experiment.

This procedure is almost identical to the one you used in Experiment 3 on simple reflex conditioning except that in this procedure you will touch your subject's left foot on UCS trials and their right foot on trials that will not have a breath strip. When you think about this procedure, what do you suppose will happen?

In sum, the experimenter waits for a time then touches either the subject's right or left foot. The subject then sticks out their tongue. The experimenter then touches the subject's tongue with either a blank Q-tip or with a Listerine strip. The subject then reports how much they salivated.

Practice / Calibration Trials

This practice procedure is to get the experimenter and the subject comfortable with the various steps.

Find a location where the subject and experimenter can sit across from one another at a table with the subject blind-folded in a comfortable position that they can maintain for about an hour. One possibility is with the chin on the fist and the elbow on the table. The experimenter is to find a way to sit with their foot next to the subject's foot so that the experimenter can quickly and conveniently touch either of the subject's feet without the subject knowing it is coming (because it will be very easy for the subject to condition to any confounded changes in the environment). Additionally, the experimenter must be able to pick up the Q-tip and pre-position their hand in front of the subject's face above their mouth without the subject being able to tell. When the tongue comes out, it needs to be easy to simply lower the Q-tip to the tongue because this must be done very quickly.

Provide a proforma explantion to your subject of what you will be doing even though they read this chapter, then <u>blindfold</u> your subject and <u>turn on the background noise</u>.

The experimenter will practice:
1. During the time between trials the experimenter:
    1) enters the actual time the Q-tip touched the tongue on the preceding trial
    2) looks at how long to wait before administering the next trial
    3) what type of trial is coming up either left foot UCS, left foot blank, or right foot blank, and
    4) approximately what time they should get ready by loading or not loading the Q-tip and positioning their hand above the nose,
2. When a trial is to occur, the experimenter touches the Q-tip into the water and then: picks up a breath strip by touching the wet Q-tip on the breath strip, or not picking one up if it is a blank trial. In either case, they position their hand above the subject's mouth
3. When the ITI time is up, without warning the experimenter touches the indicated foot with their foot while holding the Q-tip above the subject's

mouth

4. Then quickly touching the Q-tip to the center of the subject's tongue when the subject sticks their tongue out. A foot touch followed by the Q-tip touch should occur totally without warning and as quickly as possible without it becoming confusing, clumsy, or dangerous.

Note that the touch can be off by a few seconds with respect to the programmed ITI length, but the time from foot touch to Q-tip on the tongue should be as short as possible and still be comfortable to do.

The subject will practice:
1. quickly sticking out their tongue with their mouth open when touched on the foot
2. returning their tongue inside their mouth immediately after the Q-tip touches it,
3. counting silently to 10 seconds, and then
4. reporting how much salivation they experienced.

Carryout four initial blank trials (two left blank and two right blank) and one conditioning trial (left UCS) spaced according to the practice programming data sheet located in the following section. Initiate each trial at the elapsed time designated on the Practice Differential Conditioning Programming sheet. Do not start a trial before the specified time. Do not get up, do not remove the blindfold and do not talk. As is specified on the Practice Differential Reflex Conditioning Programming Data Sheet in the next section of this lab, wait 71 seconds on the first trial, then touch the right foot, then apply a blank Q-tip.

It is important that the first possibility that the subject can know that a CS and US is coming is the actual touch on the foot. It should be a surprise but not something that startles or cause them to jump. If the experimenter gives signs that a trial is coming by making any "getting ready" signals, then the amount of conditioning will be diminished. The shorter the time from the foot touch until the Q-tip plus breath strip touches their tongue, the better the conditioning.

This bears repeating: **If the experimenter "telegraphs' that a trial is coming by making some getting ready noises such as shifting in their chair, then those stimuli will become the conditioned stimuli <u>rather than the foot touch.</u>** Therefore, be sure to have some background music playing and make some occasional fake getting-ready-to-present-the-CS noises at random times throughout the intertrial intervals. Do not talk <u>at all</u> during the experiment because it will be very easy for the subject to condition to the changes in the pace of the conversation.

During the practice, on blank trials, you place only the Q-tip on their tongue. The experimenter touches the Q-tip into the water and then touches the subject's left or right foot with their foot while holding the Q-tip. When the subject sticks out their tongue, the experimenter immediately places the Q-tip on the center of the tongue. The subject replaces their tongue, counts silently to 10, and then labels the amount of saliva flowing on that practice trial as the result of only the Q-tip a "0." The experimenter enters the trial start time during the 10 second wait, and the subject's response (i.e., 0) in the appropriate box of the data sheet after the subject reports that value. The experimenter then quietly looks at the programming sheet for what to do next and quietly waits for when to get ready.

These practice blank trials are to allow the subject to know what the minimum amount of saliva is labeled and prove that the foot touch is truly neutral. Keep track of this practice/habituation sequence by placing the salivation rating which is defined as zero on the lines of the Differential Reflex Conditioning Practice / Calibration Data Sheet after the subject says "zero" for those four trials. Recall that the subject is to assign that amount of salivation a zero because that's how much they salivate without any reflex eliciting stimulus. It is how much they salivate normally when no reflex eliciter (the breath strip) is presented. This is the baseline against which your procedure is to be compared.

On the fifth trial of the practice set, following its intertrial interval as specified in the practice sheet (130 seconds) the experimenter touches the Q-tip into the water, and then touches the center of one of the breath strips. Then touches the subject's left foot with their foot while holding the Q-tip with the breath pad on it. When the subject sticks out their tongue, the experimenter immediately places the breath strip on the center of the tongue. The subject replaces their tongue, counts silently to 10, during that time the experimenter is to write down the actual time the trial was administered. The subject then reports the amount of saliva in their mouth on that particular trial as the result of the breath strip a "10." This is to allow the subject to know the maximum amount of saliva elicited by a breath strip is labeled a 10. The experimenter enters the subject's response (i.e., 10) in the appropriate box of the practice data sheet.

Following this practice, the experimenter and subject are to discuss any problems with the procedure and correct them. This is especially the case for the subject being able to detect that a trial is imminent or that the physical positions are uncomfortable.

Actual Reflex Conditioning Experiment

The experiment proper is then begun. The experimenter is to formally remind the subject of the task by saying: "consider the amount of salivation you

experienced on the 4 blank trials during practice as an amount labeled a "0" and the amount of salivation you experienced on the breath strip trial as an amount labeled a "10". Based on those amounts of salivation and those assigned values, I would like you to rate the amount of salivation you experience on each of the following trials. When given a breath strip you may decide that it is more or less salivation than the amount you exhibited during the practice so you can adjust what number you say below or above 10. When given no breath strip; you may decide that the amount is more or less salivation than the amount you exhibited during the practice so you can adjust what number you say above or below 0."

The experimenter is to follow the procedure as practiced and specified on the "Differential Reflex Conditioning Programming Data Sheet" located in the following section of this manual. Present a breath strip on UCS trials and present only the Q-tip on "blank" trials. The subject counts 10 after each and then reports the amount of salivation. Carry out the trials specified on the programming data sheets exactly like the previous practice trials. Present the touch/Q-tip at the time specified in the Differential Reflex Conditioning Programming Sheet. The rating of salivation from the initial trial onward should be the actual rated subjective amount of salivation whatever amount that is, it need not necessarily be just either a 10 or a 0. The experimenter records the subjectively experienced amount of salivation on each trial including the blank trials on the Reflex Conditioning Programming Sheet.

Note that the left foot blank trials during the experimental procedure are so that you can see how the left foot touch is actually coming to elicit salivation even in the absence of the breath strip. The salivation on those trials cannot be the reaction to a breath strip because none was presented on that trial,

Actual Experiment Trials

The experiment proper is then begun. Following the elapse of the first intertrial interval, the experimenter touches the Q-tip into the water, and then touches the center of one of the breath strips. Then touch the left foot with their foot while holding the Q-tip with the breath strip on it. When the subject sticks out their tongue, the experimenter places the breath strip on the center of the tongue. The subject replaces their tongue and counts silently to 10. Following these 10 seconds when the subject reports the amount of saliva flowing on this particular trial. The experimenter enters the subject's response in the appropriate box of the data sheet.

Wait the specified time between each trial. You and the subject should not talk and do not get up or remove the blindfold. Again, **be very careful not to give any hints about when a trial is about to start.**

Carry out the remaining trials by either touching the left foot or the right foot and provide the breath strip as specified on the programming data sheet. The preset procedure is basically the same as the previous reflex conditioning procedure implemented in Experiment 3.

Note that there are three types of trials: left touch UCS, left touch no UCS or blank, and right touch no UCS or blank.

The left touch UCS and right touch no UCS are the simple discrimination. The left touch blank trials are added so that you can monitor the learning to respond to the left touch even when there is no UCS presented whatsoever.

The amount of salivation expected on each type of trial is straightforward to predict and is illustrated in the following figures. 1) On trials with the UCS following left foot touch, the amount of salivation will be close to 10, because after all the Listerine strip was administered. It is the active baseline. 2) On trials that are signaled to have no UCS (right foot touch), salivation may initially occur as the result of generalization from the left foot touch. This would be expected to diminish as the discrimination formed. 3) The amount of salivation to the left foot touch without a UCS (a blank trial) would be expected to increase exactly as it had in the previous lab. It is an assessment of the conditioning.

The rating of salivation from the initial trial onward should be the actual subjective experience whatever it is. Present a breath strip on UCS trials and present only the Q-tip on blank trials. The subject counts 10 after each and then reports the amount of salivation. Record the subjectively experienced amount of salivation on each trial including the amount experienced on the blank trials.

Exactly the same procedure is carried out on the second, third, and fourth sessions and uses the third, fourth, and fifth data sheets.

The critical test of conditioning is, of course, the amount of salivation that occurs on left foot touch blank trials. Recall that:

1) Both the right touch and the left touch elicited zero salivation when neither were accompanied by the Listerine UCS during the practice trials.

2) The right touch (CS/blank trials) was never accompanied by the Listerine UCS and it would be expected that there would be only salivation arising from

generalization or confusion (a right touch is similar to a left touch). Eventually, we would expect discrimination and a loss of any responding to a right touch.

3) During normal left trials (CS+/US trials), salivation to the UCS would be expected.
4) But, on left blank trials (CS+/blank trials), salivation could only occur because the salivation was conditioned to the left foot touch. The salivation is not occurring because of the UCS because the UCS is not being presented on blank trials.

Acquisition Performance to be Expected (Combined)
(Differential Reflex Conditioning)
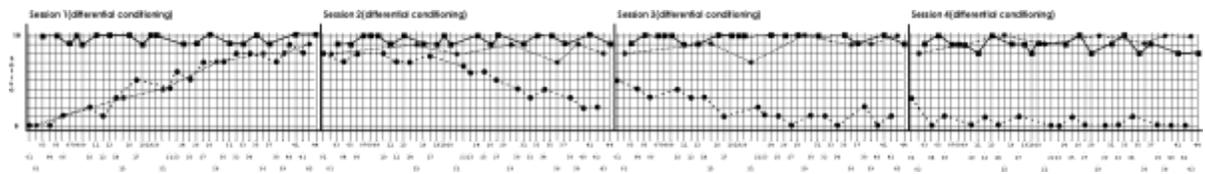
Acquisition Performance to be Expected for Sessions 1, 2, 3, and 4
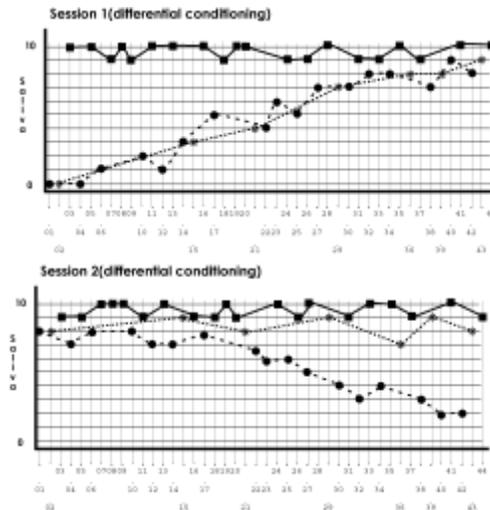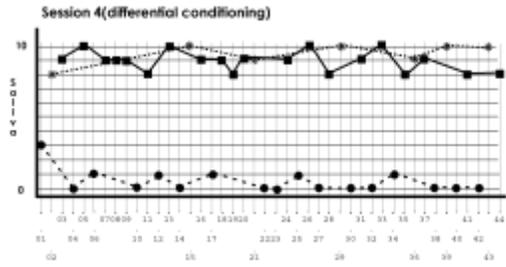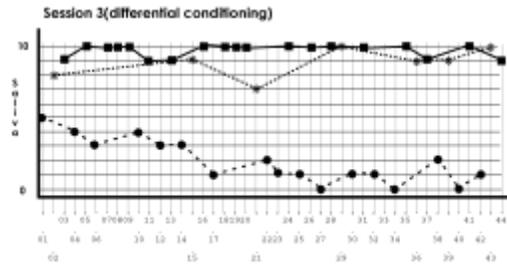
Session 3(differential conditioning)

Session 4(differential conditioning)

320

Student ID _____   Section _____

Date   _____

Practice
Differential Reflex Conditioning
Programming Data Sheet

Trial #	ITI	Programmed Cumulative		Actual Time	Procedure		Rating of Salivation	Subject's Response
		Sec	Min + Sec		CS	UCS		
Start		0	0:00					
1	71	71	1:11		Left	blank	Define as 0	
2	58	149	2:29		Right	blank	Define as 0	
3	38	207	3:27		Left	blank	Define as 0	
4	45	272	4:32		Right	blank	Define as 0	
5	130	422	7:02		Left	UCS	Define as 10	

Student ID _____   Section _____

Date _____

Differential Reflex Conditioning
Programming / Data Sheet (Session 1)

Trial #	ITI	Prog Time Sec	Prog Time Min + Sec	Actual Time	Procedure CS	UCS	Rating of Salivation
Start		0	0:00				
1	71	71	1:11		Right	Blank	
2	58	149	2:29		Left	Blank	
3	38	207	3:27		Left	UCS	
4	45	272	4:32		Right	Blank	
5	130	422	7:02		Left	UCS	
6	89	531	8:51		Right	Blank	
7	81	632	10:32		Left	UCS	
8	63	715	11:55		Left	Blank	
9	155	890	14:50		Left	UCS	
10	187	1097	18:17		Right	Blank	
11	54	1171	19:31		Left	UCS	
12	72	1263	21:03		Right	Blank	
13	42	1325	22:05		Left	UCS	
14	97	1442	24:02		Right	Blank	
15	155	1617	26:57		Left	Blank	
16	89	1726	28:46		Left	UCS	
17	35	1781	29:41		Right	Blank	
18	69	1870	31:10		Left	UCS	
19	52	1942	32:22		Left	UCS	
20	81	2043	34:03		Left	UCS	
21	45	2108	35:08		Left	Blank	
22	270	2398	39:58		Right	Blank	
23	75	2493	41:33		Right	Blank	
24	42	2555	42:35		Left	UCS	
25	76	2651	44:11		Right	Blank	
26	58	2729	45:29		Left	UCS	
27	38	2787	46:27		Right	Blank	
28	200	3007	50:07		Left	UCS	
29	45	3072	51:12		Left	Blank	
30	89	3181	53:01		Right	Blank	
31	81	3282	54:42		Left	UCS	
32	63	3365	56:05		Right	Blank	
33	155	3540	59:00		Left	UCS	
34	187	3747	1:02:27		Right	Blank	
35	54	3821	1:03:41		Left	UCS	
36	42	3883	1:04:43		Left	Blank	
37	60	3963	1:06:03		Left	UCS	
38	97	4080	1:08:00		Right	Blank	
39	42	4142	1:09:02		Left	Blank	
40	89	4251	1:10:51		Right	Blank	
41	35	4306	1:11:46		Left	UCS	
42	69	4395	1:13:15		Right	Blank	
43	77	4492	1:14:52		Left	Blank	
44	100	4612	1:16:52		Left	UCS	

Student ID _____   Section _____

Date _____

Differential Reflex Conditioning
Programming / Data Sheet (Session 2)

Trial #	ITI	Prog Time Sec	Prog Time Min + Sec	Actual Time	Procedure CS	UCS	Rating of Salivation
Start		0	0:00				
1	71	71	1:11		Right	Blank	
2	58	149	2:29		Left	Blank	
3	38	207	3:27		Left	UCS	
4	45	272	4:32		Right	Blank	
5	130	422	7:02		Left	UCS	
6	89	531	8:51		Right	Blank	
7	81	632	10:32		Left	UCS	
8	63	715	11:55		Left	Blank	
9	155	890	14:50		Left	UCS	
10	187	1097	18:17		Right	Blank	
11	54	1171	19:31		Left	UCS	
12	72	1263	21:03		Right	Blank	
13	42	1325	22:05		Left	UCS	
14	97	1442	24:02		Right	Blank	
15	155	1617	26:57		Left	Blank	
16	89	1726	28:46		Left	UCS	
17	35	1781	29:41		Right	Blank	
18	69	1870	31:10		Left	UCS	
19	52	1942	32:22		Left	UCS	
20	81	2043	34:03		Left	UCS	
21	45	2108	35:08		Left	Blank	
22	270	2398	39:58		Right	Blank	
23	75	2493	41:33		Right	Blank	
24	42	2555	42:35		Left	UCS	
25	76	2651	44:11		Right	Blank	
26	58	2729	45:29		Left	UCS	
27	38	2787	46:27		Right	Blank	
28	200	3007	50:07		Left	UCS	
29	45	3072	51:12		Left	Blank	
30	89	3181	53:01		Right	Blank	
31	81	3282	54:42		Left	UCS	
32	63	3365	56:05		Right	Blank	
33	155	3540	59:00		Left	UCS	
34	187	3747	1:02:27		Right	Blank	
35	54	3821	1:03:41		Left	UCS	
36	42	3883	1:04:43		Left	Blank	
37	60	3963	1:06:03		Left	UCS	
38	97	4080	1:08:00		Right	Blank	
39	42	4142	1:09:02		Left	Blank	
40	89	4251	1:10:51		Right	Blank	
41	35	4306	1:11:46		Left	UCS	
42	69	4395	1:13:15		Right	Blank	
43	77	4492	1:14:52		Left	Blank	
44	100	4612	1:16:52		Left	UCS	

Student ID _____   Section _____

Date   _____

Differential Reflex Conditioning
Programming / Data Sheet (Session 3)

Trial #	ITI	Prog Time Sec	Prog Time Min + Sec	Actual Time	Procedure CS	UCS	Rating of Salivation
Start		0	0:00				
1	71	71	1:11		Right	Blank	
2	58	149	2:29		Left	Blank	
3	38	207	3:27		Left	UCS	
4	45	272	4:32		Right	Blank	
5	130	422	7:02		Left	UCS	
6	89	531	8:51		Right	Blank	
7	81	632	10:32		Left	UCS	
8	63	715	11:55		Left	Blank	
9	155	890	14:50		Left	UCS	
10	187	1097	18:17		Right	Blank	
11	54	1171	19:31		Left	UCS	
12	72	1263	21:03		Right	Blank	
13	42	1325	22:05		Left	UCS	
14	97	1442	24:02		Right	Blank	
15	155	1617	26:57		Left	Blank	
16	89	1726	28:46		Left	UCS	
17	35	1781	29:41		Right	Blank	
18	69	1870	31:10		Left	UCS	
19	52	1942	32:22		Left	UCS	
20	81	2043	34:03		Left	UCS	
21	45	2108	35:08		Left	Blank	
22	270	2398	39:58		Right	Blank	
23	75	2493	41:33		Right	Blank	
24	42	2555	42:35		Left	UCS	
25	76	2651	44:11		Right	Blank	
26	58	2729	45:29		Left	UCS	
27	38	2787	46:27		Right	Blank	
28	200	3007	50:07		Left	UCS	
29	45	3072	51:12		Left	Blank	
30	89	3181	53:01		Right	Blank	
31	81	3282	54:42		Left	UCS	
32	63	3365	56:05		Right	Blank	
33	155	3540	59:00		Left	UCS	
34	187	3747	1:02:27		Right	Blank	
35	54	3821	1:03:41		Left	UCS	
36	42	3883	1:04:43		Left	Blank	
37	60	3963	1:06:03		Left	UCS	
38	97	4080	1:08:00		Right	Blank	
39	42	4142	1:09:02		Left	Blank	
40	89	4251	1:10:51		Right	Blank	
41	35	4306	1:11:46		Left	UCS	
42	69	4395	1:13:15		Right	Blank	
43	77	4492	1:14:52		Left	Blank	
44	100	4612	1:16:52		Left	UCS	

Student ID _____   Section _____

Date _____

Differential Reflex Conditioning
Programming / Data Sheet (Session 4)

Trial #	ITI	Prog Time Sec	Prog Time Min + Sec	Actual Time	Procedure CS	UCS	Rating of Salivation
Start		0	0:00				
1	71	71	1:11		Right	Blank	
2	58	149	2:29		Left	Blank	
3	38	207	3:27		Left	UCS	
4	45	272	4:32		Right	Blank	
5	130	422	7:02		Left	UCS	
6	89	531	8:51		Right	Blank	
7	81	632	10:32		Left	UCS	
8	63	715	11:55		Left	Blank	
9	155	890	14:50		Left	UCS	
10	187	1097	18:17		Right	Blank	
11	54	1171	19:31		Left	UCS	
12	72	1263	21:03		Right	Blank	
13	42	1325	22:05		Left	UCS	
14	97	1442	24:02		Right	Blank	
15	155	1617	26:57		Left	Blank	
16	89	1726	28:46		Left	UCS	
17	35	1781	29:41		Right	Blank	
18	69	1870	31:10		Left	UCS	
19	52	1942	32:22		Left	UCS	
20	81	2043	34:03		Left	UCS	
21	45	2108	35:08		Left	Blank	
22	270	2398	39:58		Right	Blank	
23	75	2493	41:33		Right	Blank	
24	42	2555	42:35		Left	UCS	
25	76	2651	44:11		Right	Blank	
26	58	2729	45:29		Left	UCS	
27	38	2787	46:27		Right	Blank	
28	200	3007	50:07		Left	UCS	
29	45	3072	51:12		Left	Blank	
30	89	3181	53:01		Right	Blank	
31	81	3282	54:42		Left	UCS	
32	63	3365	56:05		Right	Blank	
33	155	3540	59:00		Left	UCS	
34	187	3747	1:02:27		Right	Blank	
35	54	3821	1:03:41		Left	UCS	
36	42	3883	1:04:43		Left	Blank	
37	60	3963	1:06:03		Left	UCS	
38	97	4080	1:08:00		Right	Blank	
39	42	4142	1:09:02		Left	Blank	
40	89	4251	1:10:51		Right	Blank	
41	35	4306	1:11:46		Left	UCS	
42	69	4395	1:13:15		Right	Blank	
43	77	4492	1:14:52		Left	Blank	
44	100	4612	1:16:52		Left	UCS	

You may use the following four templates to display your data. Alternatively, you can make your own. Note that the sessions' figures have separate function for positive UCS trials, signaled negative trials, and blank trials.

Session 1(differential conditioning)
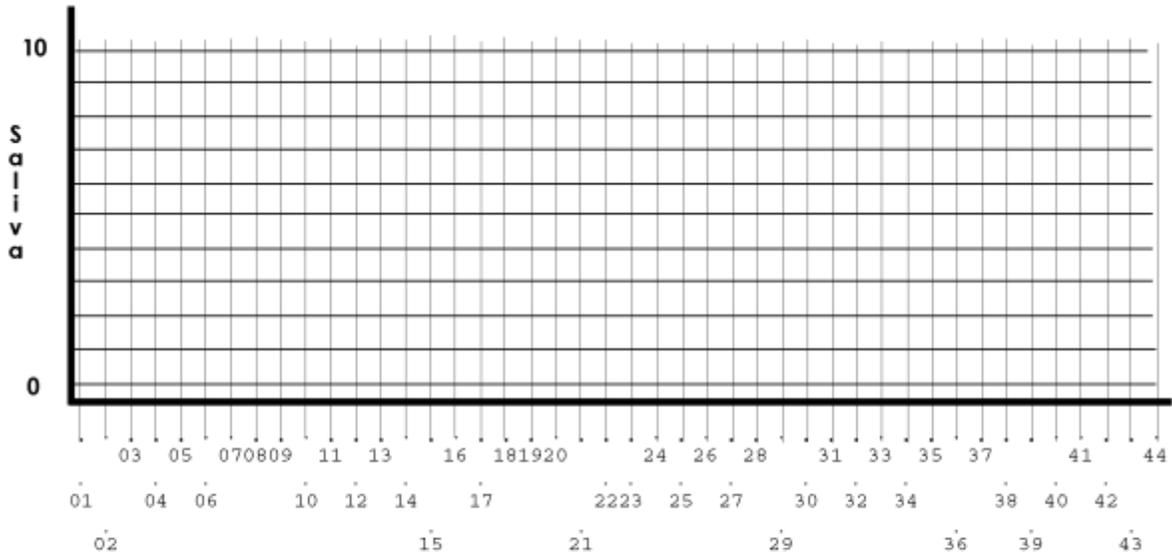
Session 2(differential conditioning)
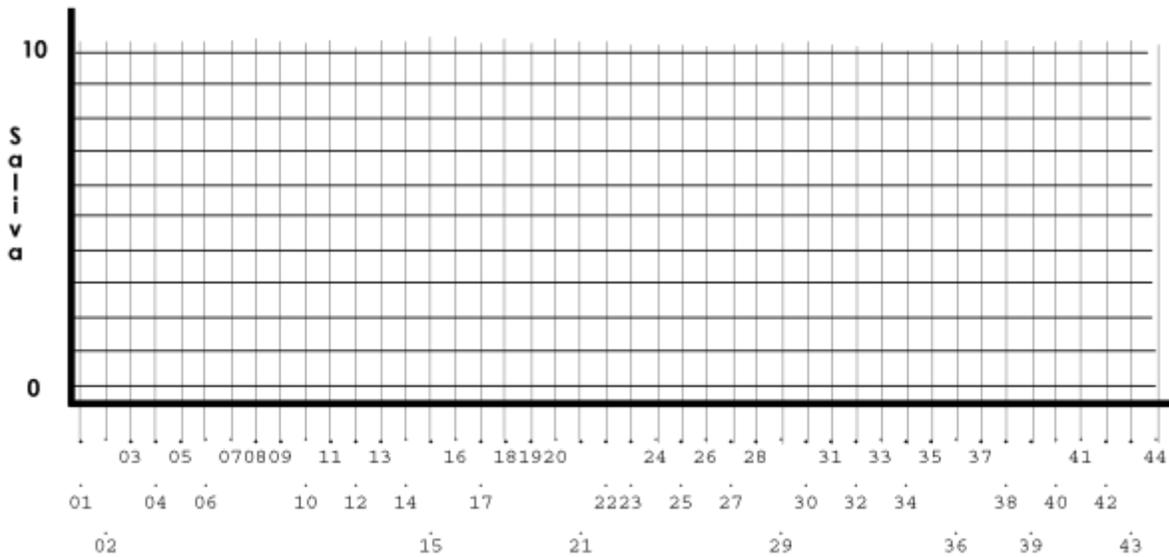
Session 3(differential conditioning)
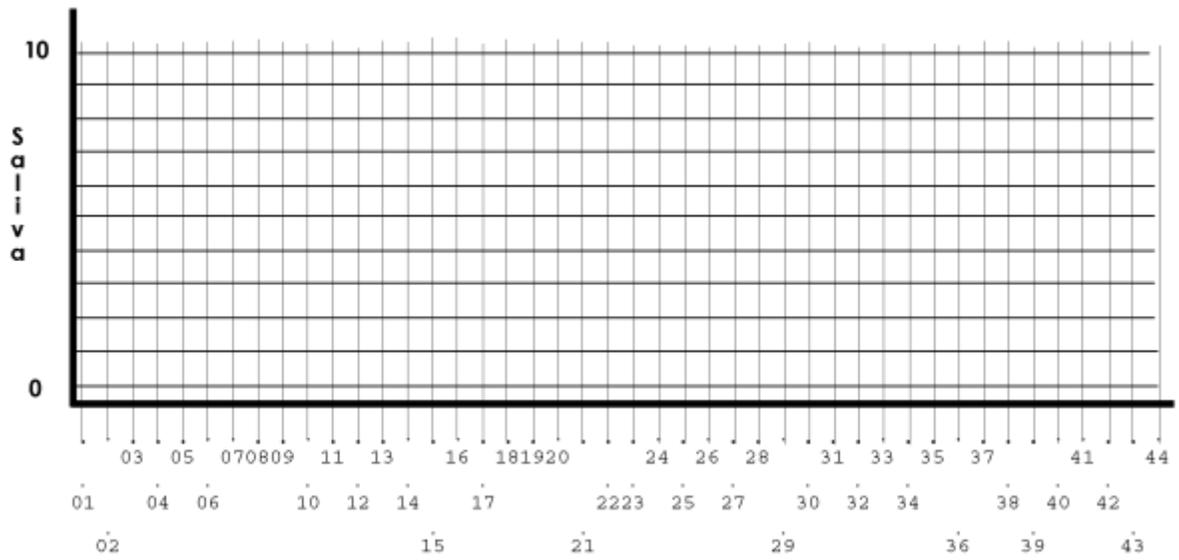
Session 4(differential conditioning)

Writing Your Research Paper

The following sample paper is a template for your research paper.

You must fill in the blank spaces, write material on your own where indicated, then type, and print out your paper on your own. **It is important that you type for yourself the prewritten sections of your paper because it will provide you with a staged exposure to the final requirements of this course and therefore make the final requirement easier.** You are getting credit for typing your paper yourself.

Do not share the typing responsibility. That is a form of plagiarism and will result in an F for the semester.

You may not work with anyone. Do not discuss your ideas or how you are going to write your paper with anyone. You cannot use as an excuse for unusual similarities with someone else's paper that you talked to them about your paper.

Refer to the "How to Write a Lab Report" section of this manual, or the lab assistants, for additional information on writing a lab report.

The Lab Reports must be typed, stapled, formatted correctly (including being typed double-space with a serif font such as Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point, and neat. You must include your actual cumulative records (or Xerox copies) stapled as a group to the back of the research paper.

Note that you will use your student ID number rather than your name. Observe the sample paper on the bulletin board of the lab to know how your paper should appear. You will lose points if our paper is not formatted correctly.

If you do not have a computer and/or a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you a day or so to learn how to type and print a paper. A second reason to start early is that you may experience a computer hardware problem that could cause your paper to be late.

Be sure to:
1. Double space and print on only one side of the paper.
2. Fill in all of the blanks in the template or sample paper.

3. Write material on your own where indicated. Do not simply retype the instructions. For example, when it asks for "your student ID number," type your student ID number and do not retype "your student ID number."
4. Submit your paper to the Canvas plagiarism site before the beginning of the lab on the day it is due.
5. Hand your lab report directly to the lab assistant before the beginning of the lab on the day it is due.

For sample papers, go to:
APA's website
apastyle.org/manual/related/sample-experiment-paper-1.pdf
or
Purdue University's OWL website
https://owl.purdue.edu

DO NOT CHEAT. You will flunk the course!

You may not copy anyone else's paper (even the typed template from a previous lab or your own paper from a previous semester).

The Canvas Plagiarism Checker will discover you are cheating and you will receive an F for the semester for doing so.

Differential Control of Involuntary Behavior by Subtle Stimuli

_____

(your student ID number)

_____

(your lab section and time)

Jacksonville State University

Abstract

Write an abstract for Experiment 5.

Differential Control of Involuntary Behavior by Subtle Stimuli

Write an Introduction for Experiment 5.

It could be argued that innate reflex behavior is not voluntary and

therefore may be totally immune to environmental experience. _____

_____

_____

_____ (*how does environment play a role on reflexes*).

The present research examined that proposition by _____

_____

_____

_____ (*what was done in the experiment*).

The Introduction section answers the WHY do the research questions surrounding the research. This section should provide to the reader enough background to understand the relevance, the point, and the meaning of the research question.

Develop how your research fits into the field of psychology. Then develop how your question evolved historically by referencing previous studies and findings. You can seek out other findings in journals (i.e., JABA, JEABA) or examples from your textbook to help you understand the relevance of your research questions. You must support your experimental question with REFERENCES.

Demonstrate the importance and significance of your research question by pointing out the impact that various possible results would have. Be careful to maintain the continuity of the developing issue, and to provide adequate contact with the literature (i.e., journal articles, textbook).

This material should be followed with a very short overview and justification for exactly what you are going to do (i.e., the procedure).

Method

Write a Method section for Experiment 5.

Subject

Apparatus

Procedure

Results

Write a Results section for Experiment 5

First briefly present the main trend of the findings with respect to the main procedural manipulation. Did the salivation rating change from baseline? Then logically present the relevant results of the procedure.

You must **PROVE** your points and not just state them. Provide quantitative measures. Present the evidence in sequential order.

Answer the following question: Did the findings provide adequate evidence that differential reflex conditioning occurred?

Discussion

The current study found that _____

_____ (*what did the study show*). The

implications with respect to understanding behavior of these findings are

_____

_____ (*what role does environment play*).

These findings are consistent with the general finding that _____

_____

_____ .

These findings help us understand applied issues relevant to everyday

behavior of humans in the following way

_____

_____ .

First summarize the results in their general or conceptual or theoretical instantiation (stimulus classes and behavior). Talk about the importance of your finding. Why is it important to help us understand behavior in general? Then provide a concrete example to illustrate it in everyday life and discuss the example.

References

Include any references that appear in your paper in APA format.

Any paper or article used and not cited is plagiarism! You must reference all your information sources.

Generate, and provide figures
substantiating the claims you made in the Results section.
Include figure captions

EXPERIMENT 6

The Schedule Control of
Response Rate

If you implement a multiple VR DRL schedule, you will prove to yourself that differences in schedules of reinforcement can control large differences in what are sometimes labeled "motivation" or "enthusiasm" or even "intelligence."

The previous operant Thorndikian conditioning lab exercises allowed you to see for yourself:

1. The effects of a Thorndikian reinforcement contingency
2. A reinforcement contingency affects the rate of an arbitrary behavior.
3. That reinforcement can be effective even when intermittent.
4. The pattern of behavior is governed by the immediate or general context of reinforcement.

The previous Pavlovian reflex conditioning lab exercise allowed you to see for yourself:

1. emotional or innate behaviors (e.g., salivation) can come to be controlled by arbitrary stimuli

In this lab, you will prove for yourself that what we take for "motivation," or "intelligence," may be nothing more than the effect of reinforcement in a particular context. You can prove to yourself that a particular schedule can make the pigeon respond "enthusiastically" or "lethargically" rather than those behaviors necessarily being the result of some internal mental state. It would be hard to believe the pigeon was enthusiastic or smart in red light and lethargic or stupid in green light.

If responding sets the occasion for a reinforced response, then every time the bird pecks, it will quickly peck again because pecks following pecks are sometimes reinforced. The result is a constant stream of pecks. This can be incorrectly described as enthusiastic or highly motivated responding. On the other hand, if only pecks following the absence of pecks are followed by reinforcement, then the

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bird will tend not to peck if it has just pecked. This is because a peck just after having pecked is never reinforced. The resulting spaced out responding is often described as being lazy, lethargic, or not knowing what to do.

One way to conceptualize these schedules and the behavior they come to control is as follows. In the schedule that reinforces pecks in the presence of previous pecks, the bird emits the behavior that signals that a peck will be reinforced (i.e., it pecks). In the other schedule, the one that reinforces a peck in the presence of having not pecked for a while, the bird also emits the behavior that signals that a peck will be reinforced (i.e., it does not peck, it waits).

An alternate way to conceptualize how the two schedules come to control two different rates is to emphasize the correlation of the response rate with the frequency or delay to food presentation. In other words, in one schedule the faster the responding, the sooner the food arrives; while in the other schedule, the slower the responding, the sooner the food arrives.

However, you wish to conceptualize the effect of the environmental contingencies on controlling behavior, you will compare the effect of these two types of schedule effects by comparing them side by side in a multiple schedule.

Take home message demonstrated by this lab:

Schedules of reinforcement that reinforce fast responding will control fast responding; schedules that reinforce slow responding will control slow responding.

Experiment 6 Time Lines
1. Establish multiple VR 60 DRL 10
2. Stabilize multiple VR 60 DRL 10
3. Stabilize multiple VR 60 DRL 10
4. Stabilize multiple VR 60 DRL 10
5. Multiple VR 60 DRL 10 stability
6. Multiple VR 60 DRL 10 stability
7. Multiple VR60 DRL10 stability

Write-up of Lab 6 Due at the beginning of the lab period on ^^December 2, 2020.

I. Task: Establish a Multiple VR DRL Schedule

You will implement a multiple schedule in this experiment. You will either reinforce a peck after the pigeon has pecked a variable number of times (a VR schedule) or only after the absence of responding (a DRL schedule) depending on which key light is on.

Apparatus Preparation

At the beginning of a session:

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Multiple Schedule: Manual** by repeatedly pressing **Schedule Select.** Be sure it is **Multiple Schedule: Manual** and not simply Multiple Schedule, otherwise the controller will not work correctly.
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the little green light is **off** – press **S* Mode** if necessary.

Procedure: *Implementing a multiple VR DRL schedule*

The red keylight will signal that a **Differential Reinforcement of Low Rate (DRL)** schedule is in effect, while the green keylight will signal that a **variable ratio (VR)** schedule is in effect.

In a DRL schedule, a reinforcer follows a key peck only and always in the presence of the same duration of having **NOT** pecked. It is important to note that the bird must peck for food to occur.

A differential reinforcement of low rate (DRL) schedule is a schedule that requires slow responding for reinforcement. For example, suppose you could not

leave a room to go watch television until a child fell asleep and you had to test that state by asking "are you asleep?" When you got no answer you could leave. If you said to the child: "are you asleep yet?" every 10 seconds, to which the child answered "no," you would miss your favorite program because your response was putting off the child falling to sleep by keeping it awake. The wise thing to do is to wait just a bit longer than the child takes to fall asleep to ask your question, otherwise you have to start your wait all over again each time you wake the child up by testing to see if they are asleep. Again, a DRL schedule requires the subject to wait then respond. A response is required for the reinforcer to be presented.

In a variable ratio schedule, reinforcement occurs in the presence of any of a wide variety of numbers of prior responses.

A variable ratio schedule is almost the exact opposite of a DRL schedule. It is like a slot machine. The more often you pull the handle, the sooner you will win something. In this case, the optimum behavior is a high, sustained rate. If you came across a slot machine in a casino that was broken and always thought a coin had just been put in then you should simply pull the handle as often and as fast as possible.

The Control Computer will automatically switch displays between the two schedules when you press the **Schedule Select** button so that one display provides the run data for the VR schedule, while the other display provides the run data for the DRL schedule. See the illustrations on pages 46, 47, and 48.

In Experiment 6, the DRL and VR schedules will be implemented in the same manner as the schedules were implemented in Experiment 4. When the contingency specified for that trial on the programming sheet occurs, press the appropriate **S* Activate** button. If the upcoming trial indicates that the key color is different than the previous trial, then change the schedule by pressing the **Schedule Select** button during reinforcement. Note! The **Schedule Select** button will work only if you press it while the reinforcement magazine is up.

Observe the programming sheet labeled multiple VR DRL schedule that is at the end of this lab assignment. The sheet specifies that when you turn on the apparatus, the keylight will be red. Press the left **S* Activate** button **after the bird has not pecked for 10 seconds.** This schedule is labeled a DRL 10-sec schedule because it reinforces pecks only after 10 seconds of no pecks. The context of reinforcement is always 10 seconds of no responding, therefore, observe the trial time in the data display **and when it reaches 10 past the time it was when the last peck occurred**, press the **S* Activate** button. If the bird pecks at any time before reaching 10 seconds past the last peck, simply start timing 10 seconds over again by requiring that the time display is 10 higher than when the peck occurred. You will need to start over a great many times at first. It may be as many as 100 times. As the bird gets more experience, you will rarely have to start over. In any event, you must wait until 10 seconds without a peck, to press the **S* Activate** button. The key color remains the same for the second trial.

Therefore, again wait for 10 seconds without a peck before pressing the left **S*** **Activate** button.

It is very difficult not to yell out in exasperation when the bird pecks 9 seconds after the last peck and to cheer the bird on as 8, 9, and 10 seconds elapse but if you are overt in your coaching, it will slow down the speed with which you will establish schedule control.

The third trial calls for a green light, so press the **Schedule Select** button while the bird is eating for the second time. The variable ratio schedule reinforces pecks after 60 pecks on the average, therefore it is labeled a VR 60 schedule. This first VR reinforces the 28th peck, so press the right **S* Activate** after 27 pecks as is indicated in the programming sheet. The next trial is also a VR trial. Press the **S*** **Activate** button after 7 pecks. Continue working through the programming sheet, changing back and forth between the schedules by pressing the **Schedule Select** button during reinforcement when the next lines on the programming sheet changes color. Arm the key by pressing the **S* Activate** button below the little red light on the control computer according to the value of the schedule written on that line of the programming sheet. Continue working through the programming sheet until the end of the session.

On the first session start at Trial 1 of the programming sheet, then do Trials 2, 3, 4, 5, etc. The second session starts at Trial 5 of the programming sheet, then do Trials 6, 7, 8, 9, etc. The third session starts at Trial 10, then do Trials 11, 12, 13, 14, etc. Each session starts five trials further down the programming sheet. This starting offset is so that the pattern of reinforcers is different every session.

You must do this procedure for at least 6 sessions (if you only want to work 2 days a week). However, if you want to get more stable data, you can run this procedure for as many as 15 sessions if you want to work the maximum of 5 days per week. The more sessions you run, the more validly you will document the behavior controlled by these schedules (and the more points you can earn).

Note that the DRL schedule is implemented on the same key color as the VI schedule had been programmed to prove beyond a shadow of a doubt that the schedule controls the behavior rather than some carryover effect. A DRL schedule will suppress a high rate that was occurring to the red key and you will prove that to yourself. **The schedule controls the behavior; it's not what the pigeon likes or knows or wants to do.** It is not the case that red controls fast pecking. Red controls the behavior engendered by the schedule it signals.

To End the Session:
1. Press **Stop/Clear** once.
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.

4. Record data from display window(s) into bottom section of daily data sheet. Note that you will have to scroll the window down with the down arrow below your display screen.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Performance to be Expected: Steady State (VR DRL)
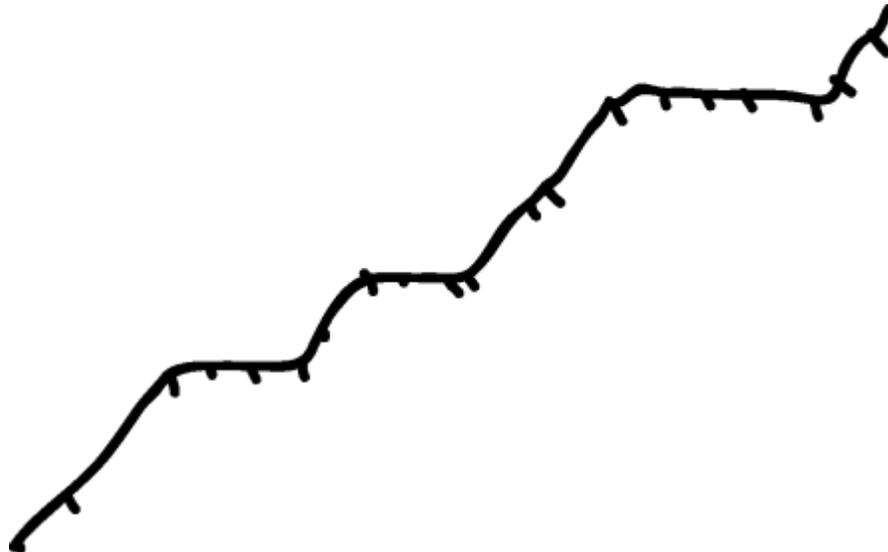
Student: Session
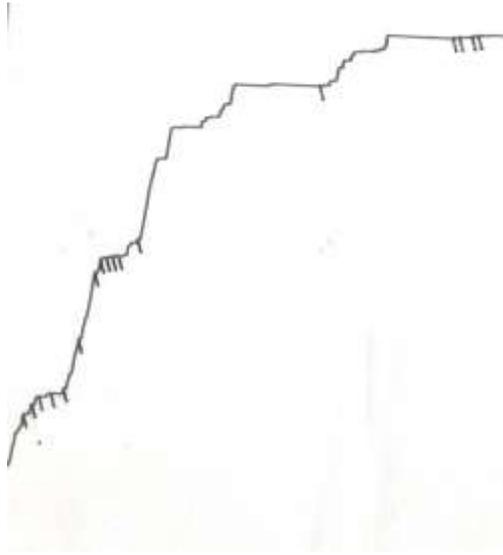
Student: Local

Criterion to Proceed

* Proceed to the next experiment when you finish at least 6 sessions of this procedure and you have the lab assistant's approval.

Data/Programming Sheets

Practice
Experiment 6 Programming Sheet
Multiple VR DRL Schedule

Trial	Key Color	Time (Sec)
1	red	10 s
2	red	10 s
3	green	3 pecks
4	green	5 pecks
5	green	5 pecks
6	red	10 s
7	green	9 pecks
8	green	7 pecks
9	red	10 s
10	red	10 s
11	red	10 s

Experiment 6 Programming Sheet
Multiple VR DRL Schedule

Trial	Key Color	Time (sec)	Pecks		Trial	Key Color	Time (sec)	Pecks
1	red	10s			36	green		44
2	red	10s			37	red	10s	
3	green		27		38	red	10s	
4	green		7		39	green		11
5	green		14		40	green		27
6	red	10s			41	green		7
7	green		58		42	red	10s	
8	green		50		43	red	10s	
9	red	10s			44	red	10s	
10	red	10s			45	green		14
11	red	10s			46	green		58
12	green		32		47	green		50
13	green		124		48	red	10s	
14	red	10s			49	red	10s	
15	red	10s			50	red	10s	
16	green		156		51	green		32
17	green		23		52	green		124
18	green		11		53	green		156
19	red	10s			54	red	10s	
20	red	10s			55	red	10s	
21	green		66		56	green		23
22	green		124		57	red	10s	
23	red	10s			58	green		11
24	red	10s			59	green		66
25	green		58		60	red	10s	
26	red	10s			61	green		124
27	red	10s			62	green		58
28	green		4		63	green		4
29	green		38		64	red	10s	
30	green		50		65	green		38
31	red	10s			66	green		50
32	red	10s			67	green		14
33	red	10s			68	red	10s	
34	green		14		69	red	10s	
35	green		239		70	red	10s	

Writing Your Research Paper

The following sample paper is a template for your research paper.

You must fill in the blank spaces, write material on your own where indicated, then type, and print out your paper on your own. **It is important that you type for yourself the prewritten sections of your paper because it will provide you with a staged exposure to the final requirements of this course and therefore make the final requirement easier.** You are getting credit for typing your paper yourself.

Do not share the typing responsibility. That is a form of plagiarism and will result in an F for the semester.

You may not work with anyone. Do not discuss your ideas or how you are going to write your paper with anyone. You cannot use as an excuse for unusual similarities with someone else's paper that you talked to them about your paper.

Refer to the "How to Write a Lab Report" section of this manual, or the lab assistants, for additional information on writing a lab report.

The Lab Reports must be typed, stapled, formatted correctly (including being typed double-space with a serif font such as Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point, and neat. You must include your actual cumulative records (or Xerox copies) stapled as a group to the back of the research paper.

Observe the sample paper on the bulletin board of the lab to know how your paper should appear. You will lose points if our paper is not formatted correctly.

Note that you are to use your student ID number rather than your name.

If you do not have a computer and/or a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you a day or so to learn how to type and print a paper. A second reason to start early is that you may experience a computer hardware problem that could cause your paper to be late.

Be sure to:
1. Double space and print on only one side of the paper.

2. Fill in all of the blanks in the template or sample paper.
3. Write material on your own where indicated. Do not simply retype the instructions. For example, when it asks for "your student ID," type your student ID and do not retype "your student ID."
4. Submit your paper to the Canvas plagiarism site before the beginning of the lab on the day it is due.
5. Hand your lab report directly to the lab assistant before the beginning of the lab on the day it is due.

For sample papers, go to:
APA's website
apastyle.org/manual/related/sample-experiment-paper-1.pdf
or
Purdue University's OWL website
https://owl.purdue.edu

DO NOT CHEAT. You will flunk the course!
You may not copy anyone else's paper (even the typed template from a previous lab or your own paper from a previous semester).
The Canvas Plagiarism Checker will discover you are cheating and you will receive an F for the semester for doing so.

Discriminative Control of Response Vigor

——————————————————————
(your student ID number)

——————————————————————
(your lab section and time)

Jacksonville State University

Abstract

Write an abstract for Experiment 6.

Discriminative Control of Response Vigor

Write an introduction for Experiment 6.

The Introduction section answers the WHY do this research questions surrounding the research. This section should provide to the reader enough background to understand the relevance, the point, and the meaning of the research question.

Develop how your research fits into the field of psychology. Then develop how your question evolved historically by referencing previous studies and findings. You can seek out other's findings in journals (i.e., JABA, JEAB) or examples from your textbook to help you understand the relevance of your research questions. You must support your experimental question with REFERENCES.

Demonstrate the importance and significance of your research question by pointing out the impact that various possible results would have. Be careful to maintain the continuity of the developing issue, and to provide adequate contact with the literature (i.e., journal articles, textbook).

This material should be followed with a very short overview and justification for exactly what you are going to do (i.e., the procedure).

Method

Write a Method section for Experiment 6.

Results

Write a Results section for Experiment 6.

Discussion

Write a Discussion section for Experiment 6.

References

Include any references that appear in your paper in APA format.

Any paper or article used and not cited is plagiarism! You must reference all your information sources.

Provide figures substantiating the claims you made in the Results section.
Include figure captions.

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: ^^Wed., March 18, 2020

> Lab Assistant's Initials Here
> Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Monday, ^^March 30, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____
_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # ____   Session # _____

Date: Wednesday, ^^April 1, 2020

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____	ad lib
_____	85% weight
_____	80% weight
_____	75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Monday, ^^April 6, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Wednesday, ^^April 8, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: Monday, ^^April 13, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____   ad lib
_____   85% weight
_____   80% weight
_____   75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____ Experiment # ____ Session # _____

Date: Wednesday, ^^April15, 2020

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

EXPERIMENT 7
Concurrent Behavior

If you implement a concurrent schedule, you will prove to yourself how what we choose to do is a function of the reinforcers available for the various alternatives.

So far this semester you have accomplished an enormous amount and can be justly proud of that accomplishment. You have proven for yourself that it is safe to build your career on the following **facts**:

1. We do what we do because we have been reinforced for it.
2. Removing a reinforcement contingency decreases the rate of an individual's behavior.
3. Reinforcement can be effective even when intermittent.
4. The molecular pattern of behavior is governed by the immediate context of reinforcement (the schedule of reinforcement enforces that immediate context).
5. Different molar behaviors can be controlled in different general contexts (such as different key colors) by the different schedules of reinforcement signaled by those keys.
6. When we have different emotional feelings than other people do to otherwise "neutral" stimuli, it is because of our Pavlovian reinforcement history.
7. Very different emotional or innate behaviors can come to be controlled by subtly different arbitrary stimuli.

This extra credit lab exercise demonstrates how the ratio of the rate of different behaviors is a function of the ratio of the rate of reinforcers for those different behaviors. You must have permission to do this lab, and that permission is based on your performance throughout the semester.

The previous labs allowed you to see for yourself the importance of the consequence of a behavior and the importance of contextual stimuli and the

molecular stimulus conditions at the moment of reinforcement. In this lab, we will take on additional complexities of the "real world" and come to understand them too.

Actually, an organism does not either behave or not behave. In point of fact, an organism emits either one behavior or some other behavior. It is always behaving from the time it's conceived until it dies. The question is which behavior is occurring and why, not whether the organism is behaving or not.

Up to this point in this class, we have been examining how the environment controls a single stream of behavior. Now we will see how the environment also controls which different behavior streams occur.

Because of the limited time available, there are several degrees of doing this experiment: 1) simply getting started, 2) getting behavioral stability, and 3) writing a paper. If you get stability under a concurrent schedule, you may put your name (or initials if you prefer) on the permanent *Honors List* on the bulletin board. If you write a paper your name (or initials) will be added to our permanent *Most Honored List*. You may include this honor on your vita when applying to graduate schools. Be sure you keep a copy of your paper so that you can submit it to your graduate school acceptance committee if they request it.

If you write a paper, you will be working with other students (past, present, and future) on the lab in order to build the big picture. Rather than each student collecting data for multiple comparisons, multiple students will each collect data on one comparison each. You will then use the group data set for your paper. Across pigeons you will be able to see how the ratio of the rate of two operants is a function of the ratio of the two reinforcement rates for those operants.

As a population, you will compare:

    VI 15-sec VI 60-sec (reinforcement ratio of 4:1)

    VI 30-sec VI 60-sec (reinforcement ratio of 2:1)

    VI 60-sec VI 60-sec (reinforcement ratio of 1:1)

    VI 60-sec VI 30-sec (reinforcement ratio of 1:2)

    VI 60-sec VI 15-sec (reinforcement ratio of 1:4)

You must do the schedule pair assigned by the lab instructor. Do not simply choose a schedule to do. The whole point is that different students will do different parts of a task too big for any one student.

Take home message demonstrated by this lab:

The relative amount of responding to each of two alternatives is determined by the relative amount of reinforcers to each of those two alternatives. For example, a behavior alternative that gets twice the reinforcers has twice as much responding.

Experiment 7 Time Lines

1. Establish concurrent behavior VI x-sec VI y-sec
2. All but the last three sessions are to stabilize concurrent VI x-sec VI y-sec
3. Last three sessions are to collect data on concurrent VI x-sec VI y-sec

Write-up of Lab 7 Due on ^^April 27, 2020.

I. Task: Establish Concurrent Behavior

As a first step in this lab, after practicing how to carry out a concurrent schedule, you will shape key pecking to the second key just as you established key pecking the first time.

The two things to keep in mind are that initially in order to shape pecking to the second key, you must focus on times when key pecking to the first key is not occurring and secondly, you must reinforce successive approximations to key pecking on the second key just as you established the initial key pecking to the first key in Experiment 1.

This procedure can only be carried out in the four large enclosed chambers ("graduate' chambers) because only those chambers have two keys. You will have to sign up for access to those chambers because several people could want to use that equipment at the same time.

A. Step 1: Practice Implementing a Concurrent VI Schedule

Note! You may need to read the following instructions while interacting with the practice programming sheet and the pigeon chamber several times before you get the hang of it all. At first the procedure you have to carry out seems impossibly complex, however, **once you get the routine down, it will be very simple to execute.** Just keep at your re-reading and practicing until you get that "Ah Ha" moment, and it comes to you, and you establish a "rhythm.".

Read the section on the concurrent schedule data display on pages 55 and 56 so you will know what the computer is telling you.

Your task of running a concurrent schedule is very simple. After reading through the lab completely, use the practice concurrent schedule programming sheet on Page 419.

In a nutshell, your task is to:

1. Simply press the left **S* Activate** button when the number of seconds specified in the left key programming sheet has elapsed since the last left key reinforcer. This elapsed time will be indicated in the upper portion of the data display.

2. Press the right **S* Activate** button when the number of seconds specified in the

right key programming sheet has elapsed since the last right key reinforcer. This elapsed time will be indicated in the lower portion of the data display.

Implementing this schedule is very simple once you realize that the schedules are totally independent. It's as if two different people were running two different pigeons in two different chambers with two different control computers at the same time. Each person was pressing their own **S*** **Activate** button.

One person looking at the left column of the practice programming sheet, the upper data display of the run data, and pressing the left **S*** **Activate** button, and a totally different person looking at the right column of the practice programming sheet, the bottom data display and pressing the right **S*** **Activate** button.

You can have both keys in both chambers set to reinforce the next peck, you could have neither set to reinforce the next peck or you could have one set to reinforce the next peck but not the other. These two keys are totally independent regardless of what the other person and the other pigeon are doing on the other schedule. The only difference between this story and what you're actually doing and your situation is that there is actually only one person, only one bird, and only one chamber.

The trick to do two schedules at once is to quickly figure out which schedule, right or left, will expire first and pay attention to that one until you arm that key, then pay attention to the other timer until you arm that key. Once they are both armed, you can just sit there and wait, before they are both armed you only have to pay attention to the one which will expire first.

B. Step 2: Apparatus Preparation for Practicing Concurrent Procedure

1. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
2. Select the schedule **Concurrent Schedule** by repeatedly pressing **Schedule Select** until you get what you want.

The display on the controller should appear as follows:

Schedule 1   Key 1 Red
Schedule 2   Key 2 Green

The controller allows either schedule to be implemented on either key and either schedule to be either color. This allows students to come in next semester and reverse the keys or the colors in order to prove that the obtained behavior is the result of the difference in the contingencies of reinforcement not which side or which color the schedules are.

If the display is not identical with the above figure, you will need to manually return it to the baseline arrangement of schedules, keys, and colors. The top row must say Sched 1 Key 1 Red. The bottom row must say Sched 2 Key 2 Green.

IF KEY AND COLOR IS CORRECT

IF KEY AND COLOR IS NOT CORRECT

Press (**S*mode**) button to place an * before the line That is incorrect.

Press left (**S* activate**) button to change the line to say Key 1 + a color. Press it again to change the color.

Press right (**S* activate**) button to change the line to say Key 2 + a color. Press it again to change the color.

Proceed with Apparatus Preparation

3. Turn the cumulative recorder paper drive switch on (up).
4. Carefully remove the pen caps and place them in the container.
5. Press **Start**.

6. Assure that the left little green light is **off**. Press left **S*mode** if necessary
7. Assure that the right little green light is **off** – press right **S* Mode** if necessary.

So far, you have turned on your controller and selected concurrent schedule and made sure the schedules and colors are on the correct keys and pressed both mode switches so the little green lights are out.

The practice session started when you pressed start. In the first two or three seconds since you pressed start, pretend you are the bird and lightly press the left key a few times. Then lightly press the right key a few times. Only press hard enough to reliably cause the cumulative recorder to operate. The keys are very sensitive.

Look at your practice programming sheet. Note that the left key or Schedule 1 should be set to reinforce the next key peck after 6 seconds from session start while Schedule 2 or the right key is to reinforce the next key peck after 11 seconds from session start.

Keep alternating your key pecking back and forth throughout the practice session. You can stay on one side or the other for different amounts of time. Do whatever strikes your fancy. You will notice that lights are on behind two keys simultaneously, and that on the Control Computer, both Schedule 1 and Schedule 2 lights are on (indicating that both schedules are running at the same time.

When the Schedule 1 time-since-reinforcement timer, located on the upper row of your controller's data window, reaches 6 seconds, press the left key **S* Activate** button. The next time you peck the left key, it will be followed by food.

At this point, several things could happen. Once the pigeon is trained on a concurrent schedule, it will be alternating back and forth between the keys relatively quickly, as a result it will be pecking each key pretty closely after you press the **S* Activate** key. During that reinforcement, cross off the Schedule 1 left key 6 sec number on your practice programming sheet so you know you already did that one, and look at your programming sheet for the time until the next Schedule 1 and the time until the next Schedule 2 reinforcer should be made available. Note that the Schedule 2 (right key) should pay off after 11 seconds since the sessions started which is 5 seconds from the left key reinforcer termination because 6 seconds had elapsed on the right key while 6 seconds was elapsing from the left key schedule and Schedule 2 (the left key) is to pay-off after 8 seconds. After the hopper drops, note that both of the timers are advancing. **When the right timer reaches 11, or the left timer reaches 8, you will press**

the right or left S* Activate button, respectively that is to say the right one in 5 seconds and then the left one in 8 seconds (i.e., 3 seconds later) if the bird is not pecking at all.

Because the Schedule 2 timer is closer to its target than the Schedule 1 timer, pay most attention to the Schedule 2 timer in the run data window. When your Schedule 2 time-since-reinforcement timer reaches 11 seconds, press the right **S* Activate** button. During this reinforcement, cross off the Schedule 2 right key 11 second number on your programming sheet. Then look at both columns of your practice programming sheet again. Note it shows a Schedule 1 (left key) reinforcer following 8 seconds since the last left reinforcer and Schedule 2 (right key) reinforcer following 10 seconds since the last right key reinforcer. When reinforcement is over, look at your Schedule 1 and Schedule 2 timers on your controller's display window. Note that the Schedule 1 has only a few more seconds before reaching 8 seconds since the previous reinforcer, while the Schedule 2 has 10 seconds remaining because the right reinforcer just occurred. Therefore pay attention to the upper timer waiting for it to turn to 8.

During the next reinforcer, note that there will be two possible reinforcers in a row on the Schedule 1 left key before the Schedule 2 right key has its next reinforcer available, because the next left reinforcer occurs in 3 seconds and the right reinforcer will not reach 10 seconds for 7 more seconds.

Continue with this practice procedure for the 5 reinforcers on each key.

Depending on how you peck the key, the programming sheet may have you set up reinforcers on one key or both keys at the same time. You may have collected reinforcers only on one key while a reinforcer was "waiting on the other key. In fact, you may have gotten all the reinforcers on one key and none on the other key.

Expect that the first time reading and stepping through the instructions, that all this will be confusing and overwhelming. Go through this practice section several times if necessary. Very quickly it will be obvious and easy.

C. Step 3: Shaping Concurrent Key Pecking

Except for Step 12 (corresponds to Practice Step 6), this and the next page are the same as setting up for practice.

D. Step 4: Apparatus Preparation for Shaping Concurrent Behavior

1. Fill in the first section of your daily data sheet
2. Assure that the food magazine is not clogged with pellet dust.
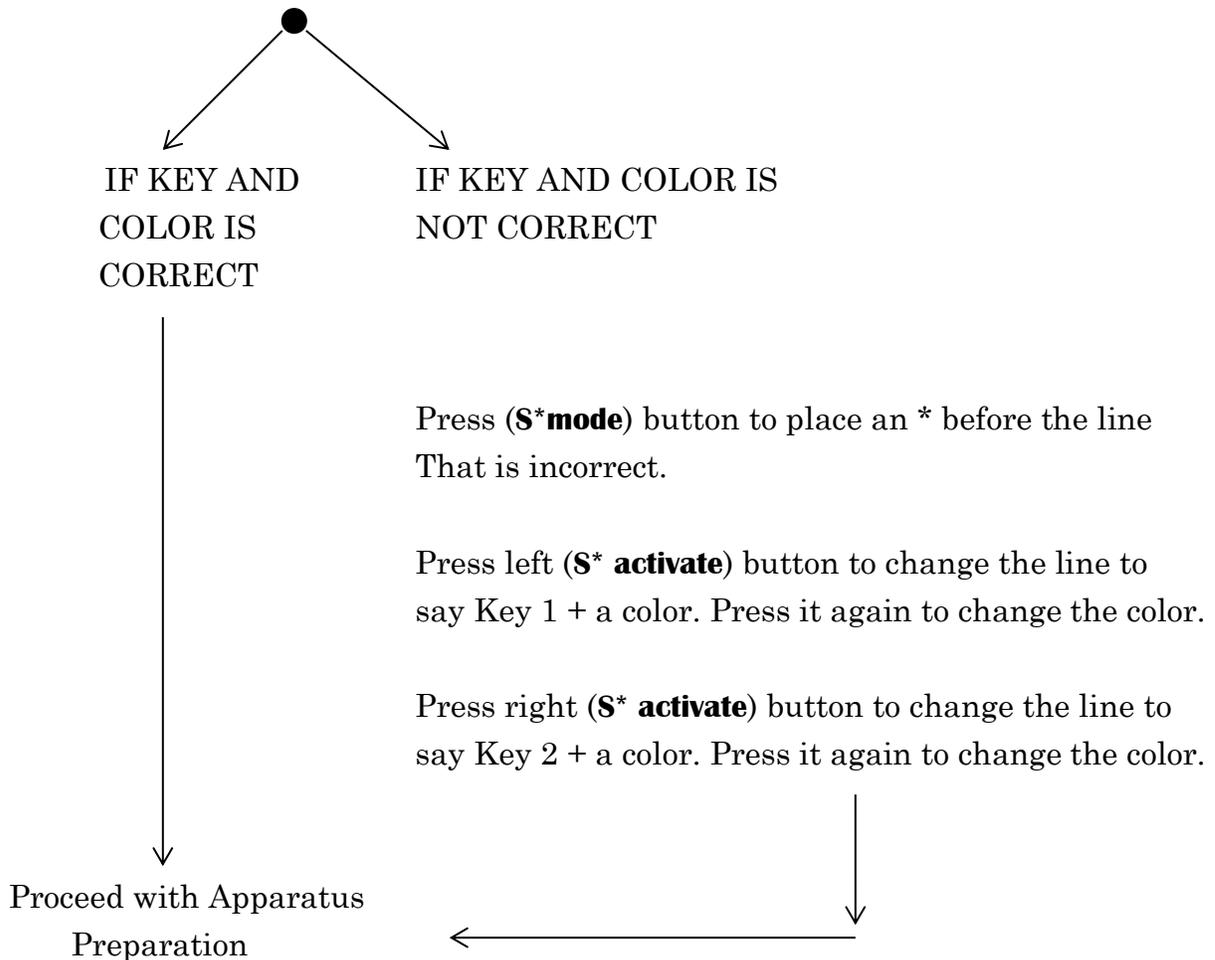3. Assure that the food hopper is full, fill it with strained pellets if necessary.
4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.
5. Select the schedule **Concurrent Schedule** by pressing **Schedule Select.**
   The display on the controller must appear as follows:

Schedule 1   Key 1 Red
Schedule 2   Key 2 Green

   The controller allows either schedule to be implemented on either key and either schedule to be either color. This allows you to reverse the keys or the colors in order to prove that the obtained behavior is the result of the difference in the contingencies of reinforcement not which side or which color the schedules are. But, to use that capability requires an additional week or so of running your bird. If the display is not identical with the above figure, you will need to manually return it to the baseline arrangement of schedules, keys, and colors. The top row must say Sched 1 Key 1 Red. The bottom row must say Sched 2 Key 2 Green.

●

IF KEY AND
COLOR IS
CORRECT

IF KEY AND COLOR IS
NOT CORRECT

Press (**S*mode**) button to place an * before the line
That is incorrect.

Press left (**S* activate**) button to change the line to
say Key 1 + a color. Press it again to change the color.

Press right (**S* activate**) button to change the line to
say Key 2 + a color. Press it again to change the color.

Proceed with Apparatus
Preparation
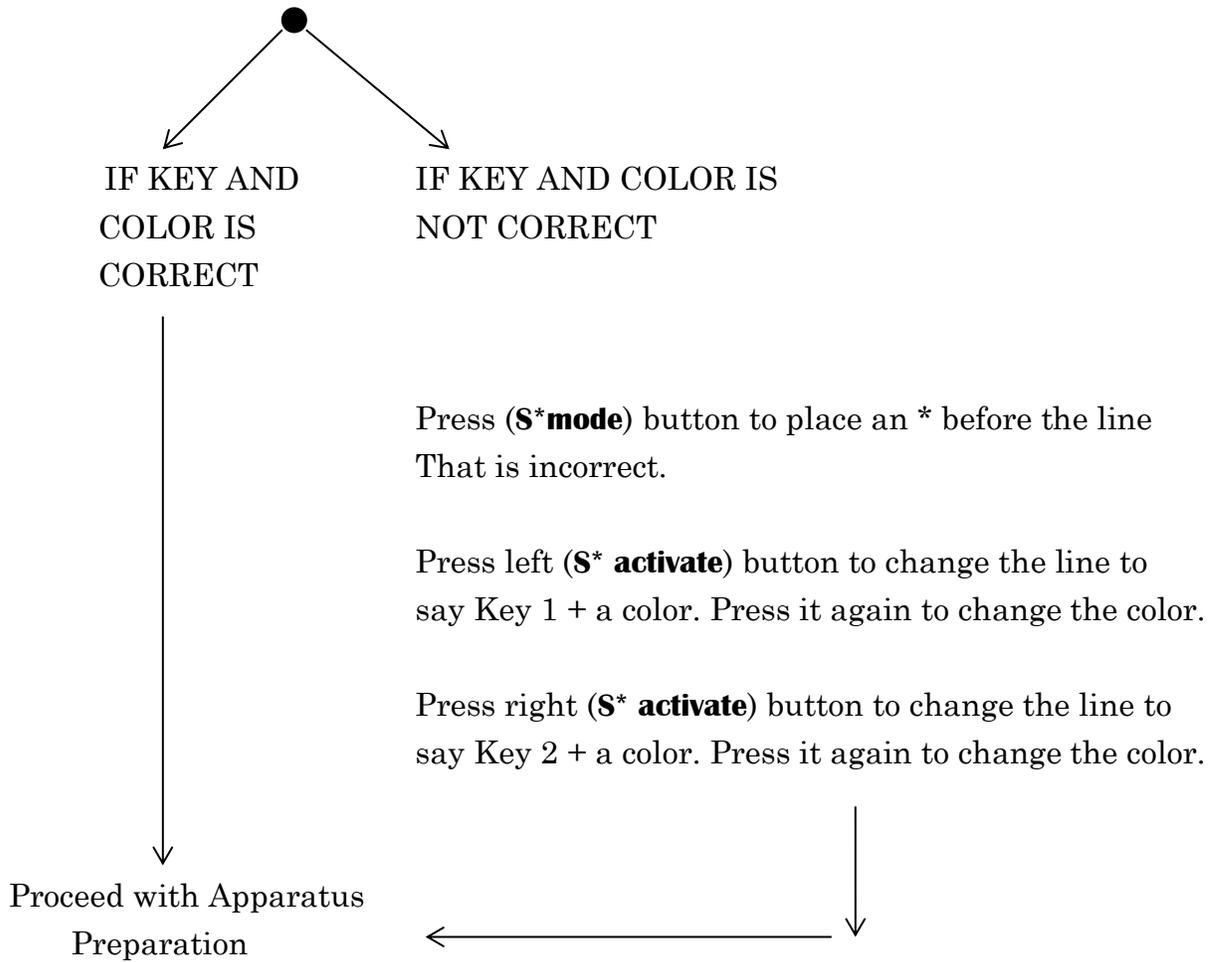
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen caps and place them in the container.
8. Get your pigeon, weigh it (don't forget to tare the scale).
9. Fill in the second section of your daily data sheet.
10. Put pigeon into chamber and press **Start**.
11. Assure that the left little green light is **off** – press left **S* Mode** if necessary. This is because the pigeon will be pecking this key at a high rate and you only need to "arm" the key.
12. Assure that the right little green light is **on**. Press right **S* Mode** if necessary. This is because the pigeon may not peck this key at all and you will need to reinforce successive approximations to key pecks (which requires the manual reinforcement mode). For example, you may need to operate the magazine when the pigeon only looks toward that key.

E. Step 5: Shaping Concurrent Behavior

You will notice that lights are on behind two keys simultaneously, and that on the Control Computer, both Schedule 1 and Schedule 2 lights are on (indicating that both schedules are running at the same time).

Your bird will probably begin pecking the original key because that has an established reinforcement history. After about 15-20 seconds of pecking the original key, reinforce the next key peck by pressing the left **S* Activate** button. Recall that nothing will happen when you press the **S* Activate** button other than the green light will flash until a key peck occurs. Continue occasionally reinforcing a key peck to this original key (the left **S* Activate** button) about once per 1 or 2 minutes.

If at any time any movement toward the right key occurs, reinforce it immediately by pressing the right S* Activate button. The right button will immediately activate the food magazine.

If your bird does not pause from pecking at all on the original key, reduce the reinforcement rate on the original key to 50% or 25% of the original reinforcment rate (i.e., enough to establish some pausing) (press the left **S* Activate** button less frequently). During those pauses, reinforce successive approximations to pecking the other key by pressing the right **S* Activate** button. Do not press the left **S* Activate** button until after you get an opportunity to reinforce a successive approximation to pecking the right key even though the bird will frequently return to pecking the left key.   It is important to note that reinforcers must occur for: i.e., both pecks to the left key and successive approximations to pecks to the right key interspersed throughout the session, **not,** for example, simply left key pecks for 10 minutes, then the shaping of a right key peck for 10 minutes. It's as if two people are independently reinforcing behavior: you on the left key and someone else reinforcing approximations to the right key. Each of you are trying to get control of the pigeon's pecking. The only interaction between the schedules should be your willingness to reduce the reinforcement frequency on the left key to generate pausing so you can shape successive approximations to right key pecks.

Once you have about 10-20 pecks to the right key, switch the right key to arm key mode by pressing the right **S* Mode** button (the right little green light will go out, then implement the final full concurrent schedule (i.e., Task II).

To End the Session:
1. Press **Stop/Clear** once**.**
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.

6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Refill the food hopper with strained pellets.
10. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Criterion to Proceed

* Proceed when the bird is pecking both keys.

II. Task: Implement Final Concurrent Schedule and Stabilize Concurrent Behavior

A. Step 1: Apparatus Preparation

If in the middle of a session:

Simply start using the concurrent schedule programming sheet.
Be sure to use the pair of schedules you were assigned.

If at the start of a session:

1. Fill in the first section of your daily data sheet

2. Assure that the food magazine is not clogged with pellet dust.

3. Assure that the food hopper is full, fill it with strained pellets if necessary.

4. Press **Stop/Clear** twice (at least 5 seconds apart) to reset the Computer.

5. Select the schedule **Concurrent Schedule** by pressing **Schedule Select.**

The display on the controller should appear as follows:

| Schedule 1 | Key 1 Red |
| Schedule 2 | Key 2 Green |

Recall that the controller allows either schedule to be implemented on either key and either schedule to be either color. This allows you to reverse the keys or the colors in order to prove that the obtained behavior is the result of the difference in the contingencies of reinforcement not which side or which color the schedules are. But, that capability requires an additional step on your part. If the display is not identical with the above figure, you will need to manually return it to the baseline arrangement of schedules, keys, and colors. The top row must say Sched 1 Key 1 Red. The bottom row must say Sched 2 Key 2 Green.

```
                    ●
                  ╱   ╲
                 ╱     ╲
                ↙       ↘
         IF CORRECT    IF NOT CORRECT
              │
              │
              │         Press (**S\*mode**) button to place an * before the line
              │         That is incorrect.
              │
              │         Press left (**S\* activate**) button to change the line to
              │         say Key 1 + a color. Press it again to change the color.
              │
              │         Press right (**S\* activate**) button to change the line to
              │         say Key 2 + a color. Press it again to change the color.
              │
              ↓                              │
                                             ↓
   Proceed with Apparatus      ←─────────────
        Preparation
```
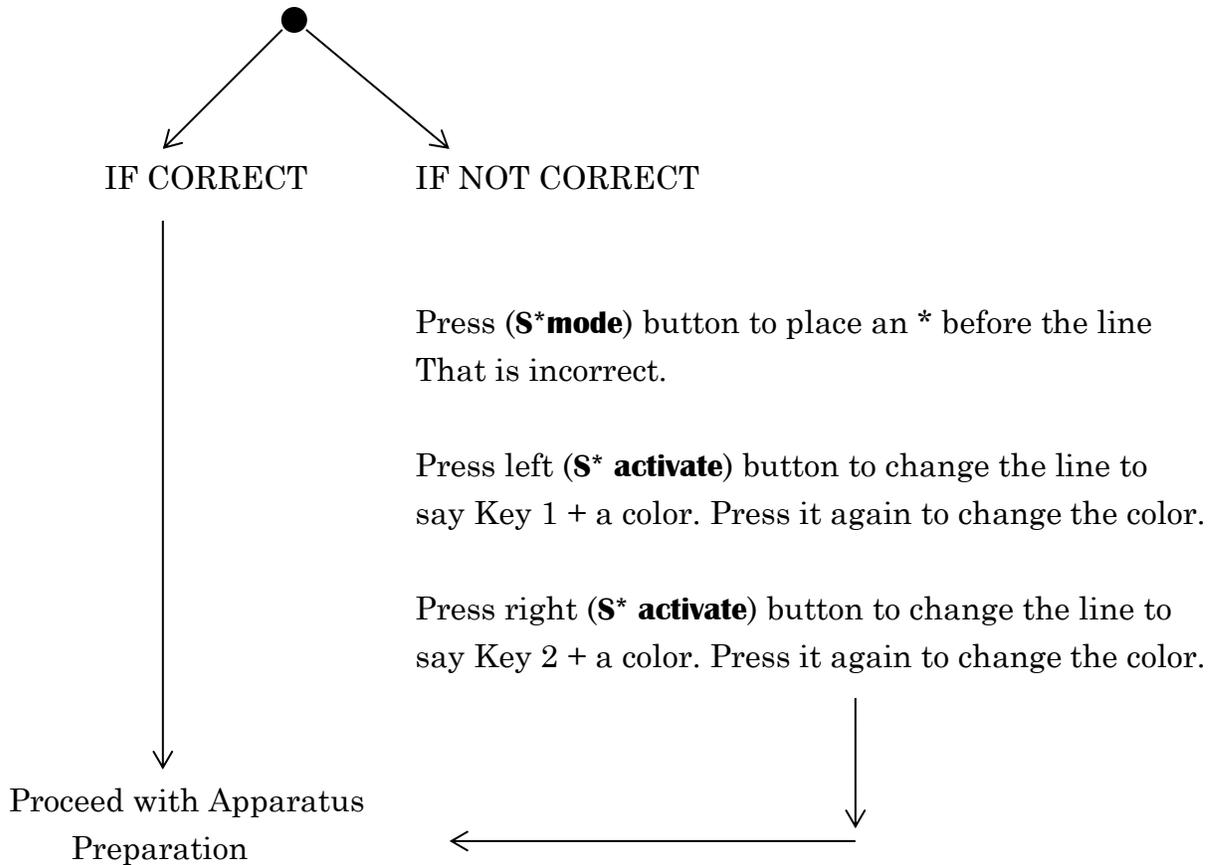
6. Turn the cumulative recorder paper drive switch on (up).
7. Carefully remove the pen cap and place them in the container.
8. Get your pigeon and weigh it (don't forget to tare the scale).
9. Fill the second section of your daily data sheet.
10. Put the pigeon into the chamber and press **Start**.
11. Assure that the left little green light is **off** – press **S* Mode** if necessary.
12. Assure that the right little green light is **off** – press right **S* Mode** if necessary.

B. Step 2: Carryout Concurrent Procedure

Implement the actual concurrent schedule just as you practiced but this time use your pigeon and the actual programming sheets. You must use the schedules assigned to you by the lab assistant. In order to avoid confusion, completely cross off and obscure the entire two left and two right columns which you will not be using so they are not distractions. Carry out the concurrent

procedure for 5 sessions. Be sure to cross off each individual scheduled reinforcement interval on each key as it occurs to avoid confusion.

C. Step 3: To End the Session

1. Press **Stop/Clear** once.
2. Remove pigeon from chamber, weigh it (tare scale), and put in home cage.
3. Fill in the post session weight section of your daily data sheet.
4. Record data from display window(s) into bottom section of daily data sheet.
5. Reset the response pen of the cumulative recorder.
6. Turn cumulative recorder paper drive switch off (down).
7. Lift the tension roller, pull out, and tear off record. Do not lift pens.
8. Carefully replace pen caps.
9. Clean bottom of chamber and replace newspaper.
10. Refill the food hopper with strained pellets.
11. Have the lab assistant, Dr. Palya, or Betty initial your daily data sheet. It is your only record of having done the required work.

Performance to be Expected:
Steady State Concurrent VI 15-sec VI 60-sec
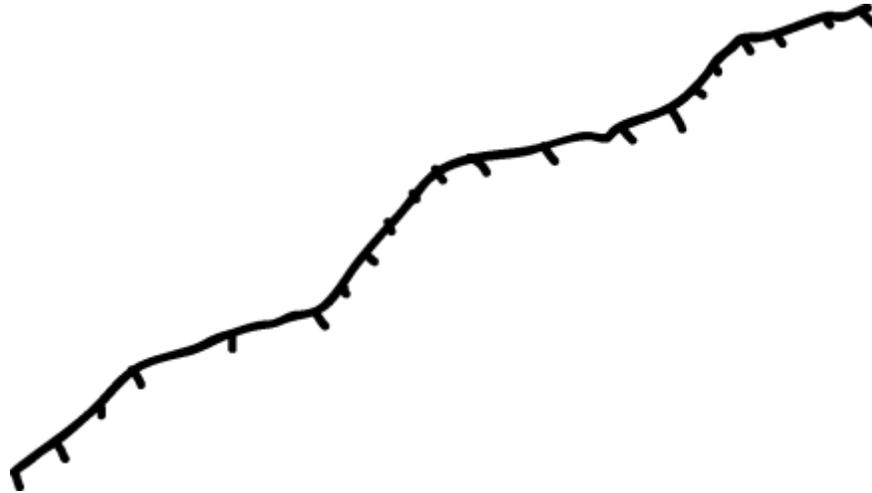
Student Session

Performance to be Expected:
Steady State Concurrent VI 30-sec VI 60-sec
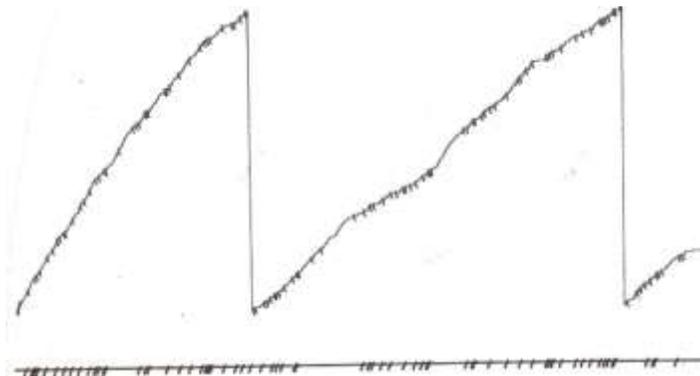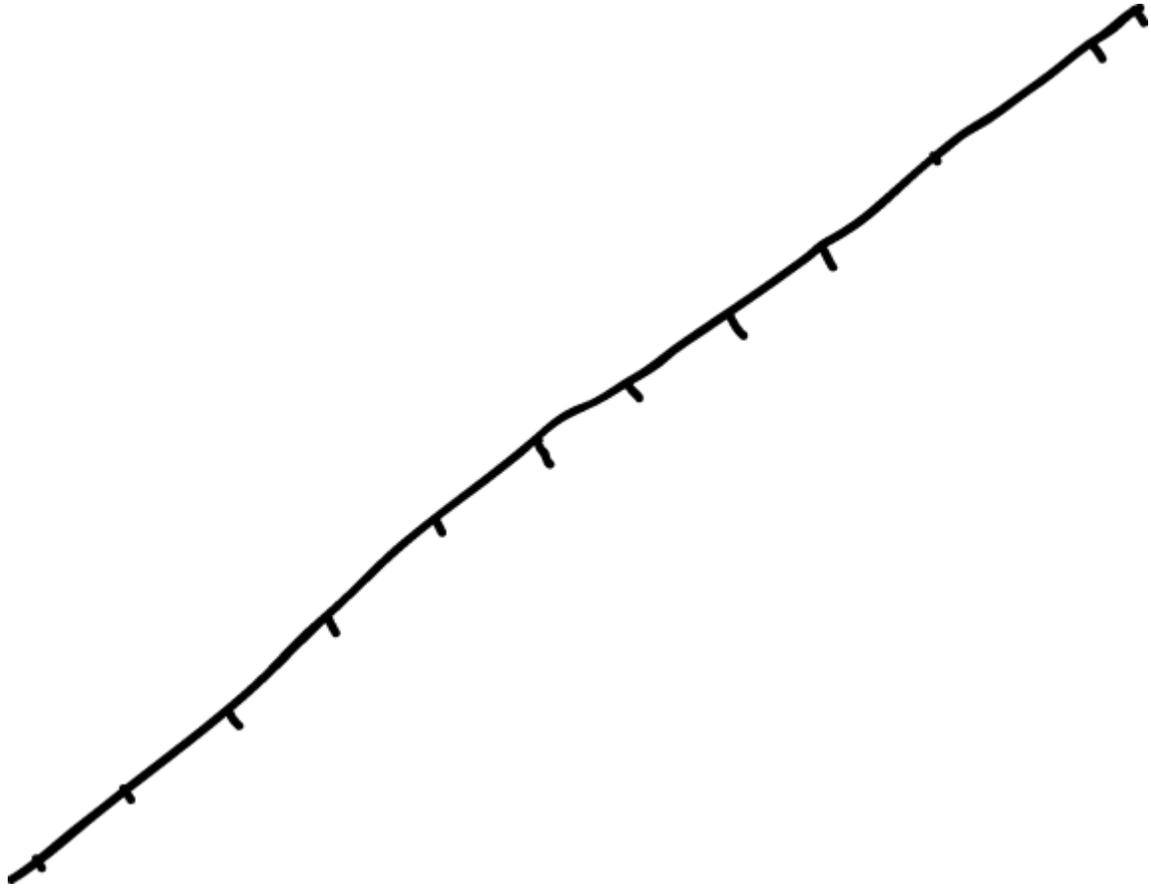
Student Session
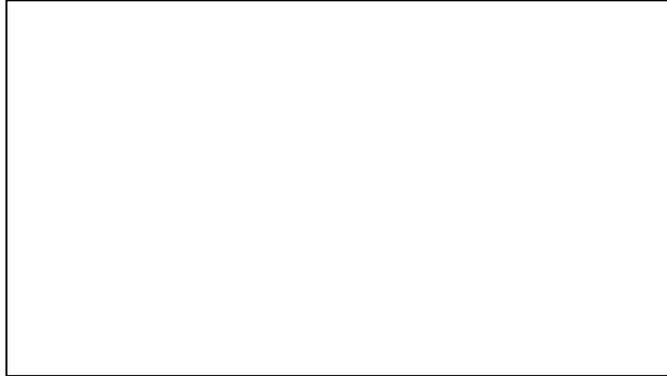
Criterion to Proceed

* If you collected at least five full sessions of a concurrent procedure, you may have your name on the honor list. If you write the paper, you may have your name on the most honored list.

* Stability is defined by 3 sessions of stable behavior where the ratio of responding to the two keys does not change much day to day.

Congratulations!

You are truly justified if you brag about what you have accomplished in this course.

Practice
Experiment 7
Concurrent VI Schedule
Programming Sheet

Trial	Upper Timer Left S* activate Schedule 1 Left Key RED VI xx Time (Sec)		Trial	Lower Timer Right S* activate Schedule 2 Right Key GREEN VI xx Time (Sec)
1	6 s		1	11 s
2	8 s		2	10 s
3	3 s		3	15 s
4	10 s		4	3 s
5	20 s		5	7 s

Concurrent VI Schedule
Programming Sheet Session 1

	Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
1	10 s	19 s	28 s		1	1 s	1 s	67 s
2	7 s	14 s	8 s		2	26 s	52 s	125 s
3	13 s	26 s	15 s		3	17 s	34 s	59 s
4	17 s	34 s	59 s		4	19 s	39 s	5 s
5	6 s	12 s	51 s		5	22 s	45 s	39 s
6	5 s	10 s	33 s		6	7 s	14 s	51 s
7	10 s	19 s	125 s		7	2 s	4 s	15 s
8	1 s	2 s	157 s		8	4 s	8 s	240 s
9	60 s	120 s	24 s		9	15 s	29 s	45 s
10	11 s	22 s	12 s		10	13 s	26 s	12 s
11	1 s	1 s	67 s		11	10 s	19 s	28 s
12	26 s	52 s	125 s		12	7 s	14 s	8 s
13	17 s	34 s	59 s		13	13 s	26 s	15 s
14	19 s	39 s	5 s		14	17 s	34 s	59 s
15	22 s	45 s	39 s		15	6 s	12 s	51 s
16	7 s	14 s	51 s		16	5 s	10 s	33 s
17	2 s	4 s	15 s		17	10 s	19 s	125 s
18	4 s	8 s	240 s		18	1 s	2 s	157 s
19	15 s	29 s	45 s		19	60 s	120 s	24 s
20	13 s	26 s	12 s		20	11 s	22 s	12 s
21	10 s	19 s	28 s		21	1 s	1 s	67 s
22	7 s	14 s	8 s		22	26 s	52 s	125 s
23	13 s	26 s	15 s		23	17 s	34 s	59 s
24	17 s	34 s	59 s		24	19 s	39 s	5 s
25	6 s	12 s	51 s		25	22 s	45 s	39 s
26	5 s	10 s	33 s		26	7 s	14 s	51 s
27	10 s	19 s	125 s		27	2 s	4 s	15 s
28	1 s	2 s	157 s		28	4 s	8 s	240 s
29	60 s	120 s	24 s		29	15 s	29 s	45 s
30	11 s	22 s	12 s		30	13 s	26 s	12 s
31	1 s	1 s	67 s		31	10 s	19 s	28 s
32	26 s	52 s	125 s		32	7 s	14 s	8 s
33	17 s	34 s	59 s		33	13 s	26 s	15 s
34	19 s	39 s	5 s		34	17 s	34 s	59 s
35	22 s	45 s	39 s		35	6 s	12 s	51 s

Concurrent VI Schedule
Programming Sheet Session 1 (continued)

| | Upper Timer Left S*activate KEY 1 Left RED | | | | | Lower Timer Right S*activate KEY 2 Right GREEN | | |
| | VI 15 Time (Sec) | VI 30 Time (Sec) | VI 60 Time (Sec) | | | VI 15 Time (Sec) | VI 30 Time (Sec) | VI 60 Time (Sec) |
Trial					Trial			
36	7 s	14 s	51 s		36	5 s	10 s	33 s
37	2 s	4 s	15 s		37	10 s	19 s	125 s
38	4 s	8 s	240 s		38	1 s	2 s	157 s
39	15 s	29 s	45 s		39	60 s	120 s	24 s
40	13 s	26 s	12 s		40	11 s	22 s	12 s
41	10 s	19 s	28 s		41	1 s	1 s	67 s
42	7 s	14 s	8 s		42	26 s	52 s	125 s
43	13 s	26 s	15 s		43	17 s	34 s	59 s
44	17 s	34 s	59 s		44	19 s	39 s	5 s
45	6 s	12 s	51 s		45	22 s	45 s	39 s
46	5 s	10 s	33 s		46	7 s	14 s	51 s
47	10 s	19 s	125 s		47	2 s	4 s	15 s
48	1 s	2 s	157 s		48	4 s	8 s	240 s
49	60 s	120 s	24 s		49	15 s	29 s	45 s
50	11 s	22 s	12 s		50	13 s	26 s	12 s
51	1 s	1 s	67 s		51	10 s	19 s	28 s
52	26 s	52 s	125 s		52	7 s	14 s	8 s
53	17 s	34 s	59 s		53	13 s	26 s	15 s
54	19 s	39 s	5 s		54	17 s	34 s	59 s
55	22 s	45 s	39 s		55	6 s	12 s	51 s
56	7 s	14 s	51 s		56	5 s	10 s	33 s
57	2 s	4 s	15 s		57	10 s	19 s	125 s
58	4 s	8 s	240 s		58	1 s	2 s	157 s
59	15 s	29 s	45 s		59	60 s	120 s	24 s
60	13 s	26 s	12 s		60	11 s	22 s	12 s
61	10 s	19 s	28 s		61	1 s	1 s	67 s
62	7 s	14 s	8 s		62	26 s	52 s	125 s
63	13 s	26 s	15 s		63	17 s	34 s	59 s
64	17 s	34 s	59 s		64	19 s	39 s	5 s
65	6 s	12 s	51 s		65	22 s	45 s	39 s
66	5 s	10 s	33 s		66	7 s	14 s	51 s
67	10 s	19 s	125 s		67	2 s	4 s	15 s
68	1 s	2 s	157 s		68	4 s	8 s	240 s
69	60 s	120 s	24 s		69	15 s	29 s	45 s
70	11 s	22 s	12 s		70	13 s	26 s	12 s

Concurrent VI Schedule
Programming Sheet Session 2

	Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
1	10 s	19 s	28 s		1	1 s	1 s	67 s
2	7 s	14 s	8 s		2	26 s	52 s	125 s
3	13 s	26 s	15 s		3	17 s	34 s	59 s
4	17 s	34 s	59 s		4	19 s	39 s	5 s
5	6 s	12 s	51 s		5	22 s	45 s	39 s
6	5 s	10 s	33 s		6	7 s	14 s	51 s
7	10 s	19 s	125 s		7	2 s	4 s	15 s
8	1 s	2 s	157 s		8	4 s	8 s	240 s
9	60 s	120 s	24 s		9	15 s	29 s	45 s
10	11 s	22 s	12 s		10	13 s	26 s	12 s
11	1 s	1 s	67 s		11	10 s	19 s	28 s
12	26 s	52 s	125 s		12	7 s	14 s	8 s
13	17 s	34 s	59 s		13	13 s	26 s	15 s
14	19 s	39 s	5 s		14	17 s	34 s	59 s
15	22 s	45 s	39 s		15	6 s	12 s	51 s
16	7 s	14 s	51 s		16	5 s	10 s	33 s
17	2 s	4 s	15 s		17	10 s	19 s	125 s
18	4 s	8 s	240 s		18	1 s	2 s	157 s
19	15 s	29 s	45 s		19	60 s	120 s	24 s
20	13 s	26 s	12 s		20	11 s	22 s	12 s
21	10 s	19 s	28 s		21	1 s	1 s	67 s
22	7 s	14 s	8 s		22	26 s	52 s	125 s
23	13 s	26 s	15 s		23	17 s	34 s	59 s
24	17 s	34 s	59 s		24	19 s	39 s	5 s
25	6 s	12 s	51 s		25	22 s	45 s	39 s
26	5 s	10 s	33 s		26	7 s	14 s	51 s
27	10 s	19 s	125 s		27	2 s	4 s	15 s
28	1 s	2 s	157 s		28	4 s	8 s	240 s
29	60 s	120 s	24 s		29	15 s	29 s	45 s
30	11 s	22 s	12 s		30	13 s	26 s	12 s
31	1 s	1 s	67 s		31	10 s	19 s	28 s
32	26 s	52 s	125 s		32	7 s	14 s	8 s
33	17 s	34 s	59 s		33	13 s	26 s	15 s
34	19 s	39 s	5 s		34	17 s	34 s	59 s
35	22 s	45 s	39 s		35	6 s	12 s	51 s

Concurrent VI Schedule
Programming Sheet Session 2 (continued)

	Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
36	7 s	14 s	51 s		36	5 s	10 s	33 s
37	2 s	4 s	15 s		37	10 s	19 s	125 s
38	4 s	8 s	240 s		38	1 s	2 s	157 s
39	15 s	29 s	45 s		39	60 s	120 s	24 s
40	13 s	26 s	12 s		40	11 s	22 s	12 s
41	10 s	19 s	28 s		41	1 s	1 s	67 s
42	7 s	14 s	8 s		42	26 s	52 s	125 s
43	13 s	26 s	15 s		43	17 s	34 s	59 s
44	17 s	34 s	59 s		44	19 s	39 s	5 s
45	6 s	12 s	51 s		45	22 s	45 s	39 s
46	5 s	10 s	33 s		46	7 s	14 s	51 s
47	10 s	19 s	125 s		47	2 s	4 s	15 s
48	1 s	2 s	157 s		48	4 s	8 s	240 s
49	60 s	120 s	24 s		49	15 s	29 s	45 s
50	11 s	22 s	12 s		50	13 s	26 s	12 s
51	1 s	1 s	67 s		51	10 s	19 s	28 s
52	26 s	52 s	125 s		52	7 s	14 s	8 s
53	17 s	34 s	59 s		53	13 s	26 s	15 s
54	19 s	39 s	5 s		54	17 s	34 s	59 s
55	22 s	45 s	39 s		55	6 s	12 s	51 s
56	7 s	14 s	51 s		56	5 s	10 s	33 s
57	2 s	4 s	15 s		57	10 s	19 s	125 s
58	4 s	8 s	240 s		58	1 s	2 s	157 s
59	15 s	29 s	45 s		59	60 s	120 s	24 s
60	13 s	26 s	12 s		60	11 s	22 s	12 s
61	10 s	19 s	28 s		61	1 s	1 s	67 s
62	7 s	14 s	8 s		62	26 s	52 s	125 s
63	13 s	26 s	15 s		63	17 s	34 s	59 s
64	17 s	34 s	59 s		64	19 s	39 s	5 s
65	6 s	12 s	51 s		65	22 s	45 s	39 s
66	5 s	10 s	33 s		66	7 s	14 s	51 s
67	10 s	19 s	125 s		67	2 s	4 s	15 s
68	1 s	2 s	157 s		68	4 s	8 s	240 s
69	60 s	120 s	24 s		69	15 s	29 s	45 s
70	11 s	22 s	12 s		70	13 s	26 s	12 s

Concurrent VI Schedule
Programming Sheet Session 3

Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN			
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
1	10 s	19 s	28 s		1	1 s	1 s	67 s
2	7 s	14 s	8 s		2	26 s	52 s	125 s
3	13 s	26 s	15 s		3	17 s	34 s	59 s
4	17 s	34 s	59 s		4	19 s	39 s	5 s
5	6 s	12 s	51 s		5	22 s	45 s	39 s
6	5 s	10 s	33 s		6	7 s	14 s	51 s
7	10 s	19 s	125 s		7	2 s	4 s	15 s
8	1 s	2 s	157 s		8	4 s	8 s	240 s
9	60 s	120 s	24 s		9	15 s	29 s	45 s
10	11 s	22 s	12 s		10	13 s	26 s	12 s
11	1 s	1 s	67 s		11	10 s	19 s	28 s
12	26 s	52 s	125 s		12	7 s	14 s	8 s
13	17 s	34 s	59 s		13	13 s	26 s	15 s
14	19 s	39 s	5 s		14	17 s	34 s	59 s
15	22 s	45 s	39 s		15	6 s	12 s	51 s
16	7 s	14 s	51 s		16	5 s	10 s	33 s
17	2 s	4 s	15 s		17	10 s	19 s	125 s
18	4 s	8 s	240 s		18	1 s	2 s	157 s
19	15 s	29 s	45 s		19	60 s	120 s	24 s
20	13 s	26 s	12 s		20	11 s	22 s	12 s
21	10 s	19 s	28 s		21	1 s	1 s	67 s
22	7 s	14 s	8 s		22	26 s	52 s	125 s
23	13 s	26 s	15 s		23	17 s	34 s	59 s
24	17 s	34 s	59 s		24	19 s	39 s	5 s
25	6 s	12 s	51 s		25	22 s	45 s	39 s
26	5 s	10 s	33 s		26	7 s	14 s	51 s
27	10 s	19 s	125 s		27	2 s	4 s	15 s
28	1 s	2 s	157 s		28	4 s	8 s	240 s
29	60 s	120 s	24 s		29	15 s	29 s	45 s
30	11 s	22 s	12 s		30	13 s	26 s	12 s
31	1 s	1 s	67 s		31	10 s	19 s	28 s
32	26 s	52 s	125 s		32	7 s	14 s	8 s
33	17 s	34 s	59 s		33	13 s	26 s	15 s
34	19 s	39 s	5 s		34	17 s	34 s	59 s
35	22 s	45 s	39 s		35	6 s	12 s	51 s

Concurrent VI Schedule
Programming Sheet Session 3 (continued)

	Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
36	7 s	14 s	51 s		36	5 s	10 s	33 s
37	2 s	4 s	15 s		37	10 s	19 s	125 s
38	4 s	8 s	240 s		38	1 s	2 s	157 s
39	15 s	29 s	45 s		39	60 s	120 s	24 s
40	13 s	26 s	12 s		40	11 s	22 s	12 s
41	10 s	19 s	28 s		41	1 s	1 s	67 s
42	7 s	14 s	8 s		42	26 s	52 s	125 s
43	13 s	26 s	15 s		43	17 s	34 s	59 s
44	17 s	34 s	59 s		44	19 s	39 s	5 s
45	6 s	12 s	51 s		45	22 s	45 s	39 s
46	5 s	10 s	33 s		46	7 s	14 s	51 s
47	10 s	19 s	125 s		47	2 s	4 s	15 s
48	1 s	2 s	157 s		48	4 s	8 s	240 s
49	60 s	120 s	24 s		49	15 s	29 s	45 s
50	11 s	22 s	12 s		50	13 s	26 s	12 s
51	1 s	1 s	67 s		51	10 s	19 s	28 s
52	26 s	52 s	125 s		52	7 s	14 s	8 s
53	17 s	34 s	59 s		53	13 s	26 s	15 s
54	19 s	39 s	5 s		54	17 s	34 s	59 s
55	22 s	45 s	39 s		55	6 s	12 s	51 s
56	7 s	14 s	51 s		56	5 s	10 s	33 s
57	2 s	4 s	15 s		57	10 s	19 s	125 s
58	4 s	8 s	240 s		58	1 s	2 s	157 s
59	15 s	29 s	45 s		59	60 s	120 s	24 s
60	13 s	26 s	12 s		60	11 s	22 s	12 s
61	10 s	19 s	28 s		61	1 s	1 s	67 s
62	7 s	14 s	8 s		62	26 s	52 s	125 s
63	13 s	26 s	15 s		63	17 s	34 s	59 s
64	17 s	34 s	59 s		64	19 s	39 s	5 s
65	6 s	12 s	51 s		65	22 s	45 s	39 s
66	5 s	10 s	33 s		66	7 s	14 s	51 s
67	10 s	19 s	125 s		67	2 s	4 s	15 s
68	1 s	2 s	157 s		68	4 s	8 s	240 s
69	60 s	120 s	24 s		69	15 s	29 s	45 s
70	11 s	22 s	12 s		70	13 s	26 s	12 s

Concurrent VI Schedule
Programming Sheet Session 4

	Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
1	10 s	19 s	28 s		1	1 s	1 s	67 s
2	7 s	14 s	8 s		2	26 s	52 s	125 s
3	13 s	26 s	15 s		3	17 s	34 s	59 s
4	17 s	34 s	59 s		4	19 s	39 s	5 s
5	6 s	12 s	51 s		5	22 s	45 s	39 s
6	5 s	10 s	33 s		6	7 s	14 s	51 s
7	10 s	19 s	125 s		7	2 s	4 s	15 s
8	1 s	2 s	157 s		8	4 s	8 s	240 s
9	60 s	120 s	24 s		9	15 s	29 s	45 s
10	11 s	22 s	12 s		10	13 s	26 s	12 s
11	1 s	1 s	67 s		11	10 s	19 s	28 s
12	26 s	52 s	125 s		12	7 s	14 s	8 s
13	17 s	34 s	59 s		13	13 s	26 s	15 s
14	19 s	39 s	5 s		14	17 s	34 s	59 s
15	22 s	45 s	39 s		15	6 s	12 s	51 s
16	7 s	14 s	51 s		16	5 s	10 s	33 s
17	2 s	4 s	15 s		17	10 s	19 s	125 s
18	4 s	8 s	240 s		18	1 s	2 s	157 s
19	15 s	29 s	45 s		19	60 s	120 s	24 s
20	13 s	26 s	12 s		20	11 s	22 s	12 s
21	10 s	19 s	28 s		21	1 s	1 s	67 s
22	7 s	14 s	8 s		22	26 s	52 s	125 s
23	13 s	26 s	15 s		23	17 s	34 s	59 s
24	17 s	34 s	59 s		24	19 s	39 s	5 s
25	6 s	12 s	51 s		25	22 s	45 s	39 s
26	5 s	10 s	33 s		26	7 s	14 s	51 s
27	10 s	19 s	125 s		27	2 s	4 s	15 s
28	1 s	2 s	157 s		28	4 s	8 s	240 s
29	60 s	120 s	24 s		29	15 s	29 s	45 s
30	11 s	22 s	12 s		30	13 s	26 s	12 s
31	1 s	1 s	67 s		31	10 s	19 s	28 s
32	26 s	52 s	125 s		32	7 s	14 s	8 s
33	17 s	34 s	59 s		33	13 s	26 s	15 s
34	19 s	39 s	5 s		34	17 s	34 s	59 s
35	22 s	45 s	39 s		35	6 s	12 s	51 s

Concurrent VI Schedule
Programming Sheet Session 4 (continued)

	Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
36	7 s	14 s	51 s		36	5 s	10 s	33 s
37	2 s	4 s	15 s		37	10 s	19 s	125 s
38	4 s	8 s	240 s		38	1 s	2 s	157 s
39	15 s	29 s	45 s		39	60 s	120 s	24 s
40	13 s	26 s	12 s		40	11 s	22 s	12 s
41	10 s	19 s	28 s		41	1 s	1 s	67 s
42	7 s	14 s	8 s		42	26 s	52 s	125 s
43	13 s	26 s	15 s		43	17 s	34 s	59 s
44	17 s	34 s	59 s		44	19 s	39 s	5 s
45	6 s	12 s	51 s		45	22 s	45 s	39 s
46	5 s	10 s	33 s		46	7 s	14 s	51 s
47	10 s	19 s	125 s		47	2 s	4 s	15 s
48	1 s	2 s	157 s		48	4 s	8 s	240 s
49	60 s	120 s	24 s		49	15 s	29 s	45 s
50	11 s	22 s	12 s		50	13 s	26 s	12 s
51	1 s	1 s	67 s		51	10 s	19 s	28 s
52	26 s	52 s	125 s		52	7 s	14 s	8 s
53	17 s	34 s	59 s		53	13 s	26 s	15 s
54	19 s	39 s	5 s		54	17 s	34 s	59 s
55	22 s	45 s	39 s		55	6 s	12 s	51 s
56	7 s	14 s	51 s		56	5 s	10 s	33 s
57	2 s	4 s	15 s		57	10 s	19 s	125 s
58	4 s	8 s	240 s		58	1 s	2 s	157 s
59	15 s	29 s	45 s		59	60 s	120 s	24 s
60	13 s	26 s	12 s		60	11 s	22 s	12 s
61	10 s	19 s	28 s		61	1 s	1 s	67 s
62	7 s	14 s	8 s		62	26 s	52 s	125 s
63	13 s	26 s	15 s		63	17 s	34 s	59 s
64	17 s	34 s	59 s		64	19 s	39 s	5 s
65	6 s	12 s	51 s		65	22 s	45 s	39 s
66	5 s	10 s	33 s		66	7 s	14 s	51 s
67	10 s	19 s	125 s		67	2 s	4 s	15 s
68	1 s	2 s	157 s		68	4 s	8 s	240 s
69	60 s	120 s	24 s		69	15 s	29 s	45 s
70	11 s	22 s	12 s		70	13 s	26 s	12 s

Concurrent VI Schedule
Programming Sheet Session 5

	Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
1	10 s	19 s	28 s		1	1 s	1 s	67 s
2	7 s	14 s	8 s		2	26 s	52 s	125 s
3	13 s	26 s	15 s		3	17 s	34 s	59 s
4	17 s	34 s	59 s		4	19 s	39 s	5 s
5	6 s	12 s	51 s		5	22 s	45 s	39 s
6	5 s	10 s	33 s		6	7 s	14 s	51 s
7	10 s	19 s	125 s		7	2 s	4 s	15 s
8	1 s	2 s	157 s		8	4 s	8 s	240 s
9	60 s	120 s	24 s		9	15 s	29 s	45 s
10	11 s	22 s	12 s		10	13 s	26 s	12 s
11	1 s	1 s	67 s		11	10 s	19 s	28 s
12	26 s	52 s	125 s		12	7 s	14 s	8 s
13	17 s	34 s	59 s		13	13 s	26 s	15 s
14	19 s	39 s	5 s		14	17 s	34 s	59 s
15	22 s	45 s	39 s		15	6 s	12 s	51 s
16	7 s	14 s	51 s		16	5 s	10 s	33 s
17	2 s	4 s	15 s		17	10 s	19 s	125 s
18	4 s	8 s	240 s		18	1 s	2 s	157 s
19	15 s	29 s	45 s		19	60 s	120 s	24 s
20	13 s	26 s	12 s		20	11 s	22 s	12 s
21	10 s	19 s	28 s		21	1 s	1 s	67 s
22	7 s	14 s	8 s		22	26 s	52 s	125 s
23	13 s	26 s	15 s		23	17 s	34 s	59 s
24	17 s	34 s	59 s		24	19 s	39 s	5 s
25	6 s	12 s	51 s		25	22 s	45 s	39 s
26	5 s	10 s	33 s		26	7 s	14 s	51 s
27	10 s	19 s	125 s		27	2 s	4 s	15 s
28	1 s	2 s	157 s		28	4 s	8 s	240 s
29	60 s	120 s	24 s		29	15 s	29 s	45 s
30	11 s	22 s	12 s		30	13 s	26 s	12 s
31	1 s	1 s	67 s		31	10 s	19 s	28 s
32	26 s	52 s	125 s		32	7 s	14 s	8 s
33	17 s	34 s	59 s		33	13 s	26 s	15 s
34	19 s	39 s	5 s		34	17 s	34 s	59 s
35	22 s	45 s	39 s		35	6 s	12 s	51 s

Concurrent VI Schedule
Programming Sheet Session 5 (continued)

Upper Timer Left S*activate KEY 1 Left RED					Lower Timer Right S*activate KEY 2 Right GREEN		
Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)		Trial	VI 15 Time (Sec)	VI 30 Time (Sec)	VI 60 Time (Sec)
36	7 s	14 s	51 s		36	5 s	10 s	33 s
37	2 s	4 s	15 s		37	10 s	19 s	125 s
38	4 s	8 s	240 s		38	1 s	2 s	157 s
39	15 s	29 s	45 s		39	60 s	120 s	24 s
40	13 s	26 s	12 s		40	11 s	22 s	12 s
41	10 s	19 s	28 s		41	1 s	1 s	67 s
42	7 s	14 s	8 s		42	26 s	52 s	125 s
43	13 s	26 s	15 s		43	17 s	34 s	59 s
44	17 s	34 s	59 s		44	19 s	39 s	5 s
45	6 s	12 s	51 s		45	22 s	45 s	39 s
46	5 s	10 s	33 s		46	7 s	14 s	51 s
47	10 s	19 s	125 s		47	2 s	4 s	15 s
48	1 s	2 s	157 s		48	4 s	8 s	240 s
49	60 s	120 s	24 s		49	15 s	29 s	45 s
50	11 s	22 s	12 s		50	13 s	26 s	12 s
51	1 s	1 s	67 s		51	10 s	19 s	28 s
52	26 s	52 s	125 s		52	7 s	14 s	8 s
53	17 s	34 s	59 s		53	13 s	26 s	15 s
54	19 s	39 s	5 s		54	17 s	34 s	59 s
55	22 s	45 s	39 s		55	6 s	12 s	51 s
56	7 s	14 s	51 s		56	5 s	10 s	33 s
57	2 s	4 s	15 s		57	10 s	19 s	125 s
58	4 s	8 s	240 s		58	1 s	2 s	157 s
59	15 s	29 s	45 s		59	60 s	120 s	24 s
60	13 s	26 s	12 s		60	11 s	22 s	12 s
61	10 s	19 s	28 s		61	1 s	1 s	67 s
62	7 s	14 s	8 s		62	26 s	52 s	125 s
63	13 s	26 s	15 s		63	17 s	34 s	59 s
64	17 s	34 s	59 s		64	19 s	39 s	5 s
65	6 s	12 s	51 s		65	22 s	45 s	39 s
66	5 s	10 s	33 s		66	7 s	14 s	51 s
67	10 s	19 s	125 s		67	2 s	4 s	15 s
68	1 s	2 s	157 s		68	4 s	8 s	240 s
69	60 s	120 s	24 s		69	15 s	29 s	45 s
70	11 s	22 s	12 s		70	13 s	26 s	12 s

Writing Your Research Paper

The following sample paper is a template for your research paper.

You must fill in the blank spaces, write material on your own where indicated, then type, and print out your paper on your own. **It is important that you type for yourself the prewritten sections of your paper because it will provide you with a staged exposure to the final requirements of this course and therefore make the final requirement easier.** You are getting credit for typing your paper yourself.

Do not share the typing responsibility. That is a form of plagiarism and will result in an F for the semester.

You may not work with anyone. Do not discuss your ideas or how you are going to write your paper with anyone. You cannot use as an excuse for unusual similarities with someone else's paper that you talked to them about your paper.

Refer to the "How to Write a Lab Report" section of this manual, or the lab assistants, for additional information on writing a lab report.

The Lab Reports must be typed, stapled, formatted correctly (including being typed double-space with a serif font such as Century Schoolbook, New Century Schoolbook, or Times New Roman in 12-point, and neat. You must include your actual cumulative records (or Xerox copies) stapled as a group to the back of the research paper.

Note that you are to use your student ID number rather than your name.

Observe the sample paper on the bulletin board of the lab to know how your paper should appear. You will lose points if our paper is not formatted correctly.

If you do not have a computer and/or a printer, you may use any of the many computers available for student use located around campus. If you do not know how to use the computer, lab assistants are available at those computer labs to help you. Do not wait until the last minute to develop the skill of typing and printing out a paper. It may take you a day or so to learn how to type and print a paper. A second reason to start early is that you may experience a computer hardware problem that could cause your paper to be late.

Be sure to:
   1. Double space and print on only one side of the paper.

2. Fill in all of the blanks in the template or sample paper.
3. Write material on your own where indicated. Do not simply retype the instructions. For example, when it asks for "your student ID," type your student ID and do not retype "your student ID."
4. Submit your paper to the Canvas plagiarism site before the beginning of the lab on the day it is due.
5. Hand your lab report directly to the lab assistant before the beginning of the lab on the day it is due.

For sample papers, go to:
　　APA's website
　　apastyle.org/manual/related/sample-experiment-paper-1.pdf
or
　　Purdue University's OWL website
　　https://owl.purdue.edu

DO NOT CHEAT. You will flunk the course!
You may not copy anyone else's paper (even the typed template from a previous lab or your own paper from a previous semester).
1. The Canvas Plagiarism Checker will discover you are cheating and you will receive an F for the semester for doing so.

The Determinants of the Ratio of Concurrent Behaviors: Choice

_____

(your student ID number)

_____

(your lab section and time)

Jacksonville State University

Write a complete lab report for Experiment 7. Include Abstract, Introduction, Method, Results, Discussion, References, and Figures.

Include the following figure in your Result's section with your data designated by a star and the data from previous students from previous semesters designated by solid dots.

Proportion of Responses to Left Key

Proportion of Reinforcers Earned on Left Key

Daily Data Sheet

Student ID _____ Experiment # ____ Session # _____

Date: _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: _____

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

    Tare scale? ☐

Before session weight _____

    Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____ Experiment # _____ Session # _____

Date: _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class ☐ With class ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date: _____

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

EXTRA CREDIT
DAILY DATA SHEETS

Extra Credit Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date _____

<table>
<tr><td>Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____</td></tr>
</table>

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

    Tare scale? ☐

Before session weight _____

    Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Extra Credit Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date _____

┌─────────────────────────────────────┐
│ Lab Assistant's Initials Here   │
│ Proceed OK _____   Daily OK _____│
└─────────────────────────────────────┘

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

  Tare scale? ☐

Before session weight _____

  Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

┌──────────────────────────┐
│ _____   ad lib   │
│ _____   85% weight   │
│ _____   80% weight   │
│ _____   75% weight   │
└──────────────────────────┘

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Extra Credit Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date _____

| Lab Assistant's Initials Here |
| Proceed OK _____   Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Extra Credit Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date _____

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐Ahead of class   ☐With class   ☐Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

Use the response logging sheet at the end of your lab for special recording (extinction, discrimination, etc.)

Special notes or comments:

Extra Credit Daily Data Sheet

Student ID _____   Experiment # _____   Session # _____

Date _____

Lab Assistant's Initials Here
Proceed OK _____   Daily OK _____

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

Your bird's weights

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____
You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
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Extra Credit Daily Data Sheet

Student ID _____ Experiment # _____ Session # _____

Date _____

| Lab Assistant's Initials Here |
| Proceed OK _____ Daily OK _____ |

Purpose of the Experiment _____

Schedule of Reinforcement _____

Exactly what behavior are you trying to obtain today? _____

_____

Weight

You must tare the scale with the weighing container by itself

Your bird's weights

Post session weight _____

Tare scale? ☐

Before session weight _____

Tare scale? ☐

Place arrow in box pointing to where today's weight would fit

_____ ad lib
_____ 85% weight
_____ 80% weight
_____ 75% weight

Data

What percentage of this experiment have you completed? _____

You are: ☐ Ahead of class   ☐ With class   ☐ Behind class

	SCHEDULE 1	SCHEDULE 2	TOTAL
Duration	_____	_____	_____
Reinforcers	_____	_____	_____
Responses	_____	_____	_____
Responses/sec R/s	_____	_____	_____
Reinforcers/min r/m	_____	_____	_____

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Special notes or comments: