**Application Goal:  To notify the user when to dispense a treat for their dog based on the selected type of reinforcement**

**Definitions:**

General:

Reinforcement - *typically a piece of food, a treat*

Marker - *a noise to signal a treat is coming.  Typically a tool like a clicker is used, very loud distinct noise box; sometimes a word is used like "yes" or a "kiss-kiss" noise (note: a dog's marker for a treat is almost always the same sound)*

Session length - *minutes you spend training your dog*

*Basic training flow:*

*Cue > Behavior > Marker > Treat*

*i.e. "Sit" > Dog Sits > Marker > Treat*

*Advanced training flow:*

*Cue > Behavior > Marker > Cue > Behavior > Marker > Treat*

*i.e. "Sit" > Dog Sits > Marker > "Down" > Dog Lays Down > Treat*

Schedules of Reinforcement:  In animal behavior, there are 4 types of reinforcement: Fixed Ratio, Variable Ratio, Fixed Interval, Variable Interval

Fixed Ratio - *This is our "soda machine", 1 dollar = 1 soda, 4 quarters = 1 soda, 10 dimes = 1 soda, etc.  In dog training, after a behavior has been taught, we gradually increase the number of behaviors needed for a treat so that we get more work for less pay.  So in the beginning of training, we go 1 behavior (e.g. "sit") = 1 treat, but an advanced dog we go 2 behaviors (e.g. "sit" - "down") = 1 treat, 3 behaviors = 1 treat, 4 behaviors, etc.*

Variable Ratio- *This is our "slot machine", X pulls of a lever = Y money.  In dog training we look at this as X behaviors = 1 treat (although we occasionally jack pot if the dog makes a huge leap in progress).* *See variable chart****[Figure 1]***below.

Fixed Interval - *This is our salaries, bi-weekly salary would be 2 weeks = 1 pay check.  In dog training we train behaviors like "stay" where a dog has to hold the behavior for a length of time.  We start with 1 second, then 2, then 3, then 5, etc etc.*

Variable Interval - *This is like being paid on commission.  You don't really know when you are going to get paid next, but you have to work hard all the time in order to close any sales.  This is definitely the most desired feature, although all four schedules of reinforcement is desirable for "kick ass"-ness (technical term, right?). See Variable Interval Chart****[Figure 2]****below.*

**Figure 1**

Variable Ratio Chart:  To the right is the randomized numbering that never passes a maximum determined by the user.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Target Ratio |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 behaviors: 1 treat | **3** | 1 | 2 | 2 | 1 | 1 | **3** | 1 | 2 | 1 | **3** | 1 | **3** | 2 | 2 | 1 | **3** |
| 4 behaviors: 1 treat | 2 | 1 | **4** | 3 | 1 | 1 | 3 | 2 | **4** | 1 | 3 | 1 | **4** | 1 | 3 | 1 | 2 |
| 5 behaviors: 1 treat | 1 | 3 | 2 | **5** | 4 | 1 | 2 | 1 | 3 | **5** | 2 | **5** | 3 | 1 | 2 | 4 | **5** |
| etc. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

*(Note: we rarely go beyond 5 behaviors but it should be selectable for training research purposes as our company is looking to study and do research in application of schedules of reinforcement)*

**Figure 2**

Variable Interval Chart:  To the right is the randomized numbering that never passes a maximum determined by the user.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Target Duration |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15 seconds: 1 treat | **15** | 3 | 10 | 4 | 4 | 7 | **15** | 12 | 8 | 1 | **15** | 9 | **15** | 11 | 6 | 7 | **15** |
| 20 seconds: 1 treat | 8 | 1 | **20** | 5 | 6 | 15 | 7 | 1 | **20** | 11 | 9 | 4 | **20** | 12 | 3 | 13 | 2 |
| 30 seconds: 1 treat | 9 | 21 | 4 | **30** | 7 | 24 | 14 | 2 | 11 | **30** | 6 | **30** | 19 | 8 | 22 | 8 | **30** |
| etc. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Here it is a basic example of how the app might function:

1. User starts a new training session and sets the Session duration:

*Options*

*Set Length - user selects for example "5 minutes" or "15 minutes", no more than one hour in length for options.*

*Start/Stop mode - training session starts and ends by user (useful for determining how hard a dog can work for before fatiguing)*

*Side note:  When the program is running with a set length for training, program should properly select variable rates/intervals so that the average is close to the actual mean (e.g. 5 seconds is selected target interval, the average of all the variable intervals is close to 3 (mean of 1:5).  If the average turns out to be off by more than 2 or 3% it will hurt the ability to do research with the application.*

2. User selects a training mode to begin with (this mode can be adjusted on the fly in a training session without restarting the session):

*Options*

*Fixed Ratio*

*Variable Ratio*

*Fixed Interval*

*Variable Interval*

3. Training session starts:

Application records the number of Markers it hears and analyzes the number of Markers with the duration of training session to determine "Reinforcements per minute" or "RPM"

Application notifies user when to give a reinforcement.  This notification is set in the settings.

4.  After training, an analysis of the training is plotted on a graph.

(see next page)

**Training Results**

9/28/12 - 4:23pm

|  |  |
| --- | --- |
| Time | RPM |
| 1 | 2 |
| 2 | 5 |
| 3 | 10 |
| 4 | 15 |
| 5 | 14 |
| 6 | 13 |
| 7 | 16 |
| 8 | 20 |
| 9 | 23 |
| 10 | 19 |
| 11 | 17 |
| 12 | 15 |
| 13 | 11 |
| 14 | 10 |
| 15 | 11 |

**Average RPM (total): 13.4 RPM**

**Average RPM for selected training mode(s):**

Fixed Ratio - 14

Variable Ratio - 0

Fixed Interval - 6

Variable Interval - 20

*Side note: sometimes a training session will only have one selected schedule of reinforcement, however if multiple are used it would be awesome if the markers were tagged with the schedules selected.*

**Lag time:**

Shortest time between markers - 2.5 seconds

Longest time between markers - 30 seconds

Average time between markers - 5.3 seconds

*Side note: RPM doesn't directly inform a trainer what their lag time is.  Lag time is time between reinforcements, this can include a dog trying to solve the cue (i.e. perform the behavior) it could also be a trainer dropped their treat pouch, they had to think for a long time after marking to think what the next behavior was going to be, etc.  In training animals we want as little lag as possible.*

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5. "What would you like to name this session?"

User enters "Sit, stay, down"

User sub-selects a category "General Obedience"

6. Data is saved into a history

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That is the bulk of the function there, continuing are some features that would be essential (at the very least eventually)

**Misc:**

**Customizable profiles for multi-dog households**  
    e.g. select dog from list  
  
**Exportable data (csv for excel or maybe just a text summary)**

idea for this is that clients could send me their data if they needed to, may not ever be a real concern but would be cool to upload data from phones to computer for research purposes.  social media exporting could be great too, pretty nerdy but people are often proud of their dog training, people share their workouts, might find they feel the desire to share their dog training on facebook

**Customizable notification settings**

How a user is notified to deliver a treat based on their schedule of reinforcement (e.g. bells, sounds, vibrations, lights, etc.)

**Random distraction on/off**

phone makes a very loud random sound to work on distraction, well, maybe not VERY loud but for instance if it's turned on, every now and then a dog starts barking in the phone, or the phone starts ringing, or a doorbell goes off, or a squeeky toy noise is made (we could make a sound bank of very distracting sounds to practice distraction training with selectable distractions)

**Tips option on startup**

    App analyzes history of reinforcement and usage and makes a very basic suggestion for the next training session

e.g. *If*Rate of Reinforcement < 10 RPM during training session *then* prompt: "Try lowering your criteria to improve your RPM"

e.g. Which "D" haven't you worked with lately?  (Refers to an aspect outside of the application, basically just a tip)

**Push setting:**

Every day at 5pm or something the phone pushes a message asking,        "Have you played with your dog today? (pawsitive packleader logo)"

**Menu Screens**  
    Ratio Training  
    Interval Training  
    Training Coach  
        -6 D's  
        -Charging the Marker  
        -Explanation of Schedules of Reinforcement  
        -Demo video  
    History  
    Settings  
  
Sexy add-ons:  
Voice recognition to catalogue verbal cues (selectable on/off)  
  
Voice recognition for people who can't use clickers and have to use a verbal marker (e.g. "Good" or "Yes") - lots of dogs are too sound sensitive for a clicker so we use verbal markers or quiet clickers.  Even the ability to "Choose your marker:" "Reg. Clicker, Quiet Clicker, Verbal Marker" would send this app over the moon for versatility.  (not essential, but not sure on feasibility given Siri is pretty good at voice recognition)

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Project Tasks:

Rundown of the features potentially included in this project:

• Training Session

o Select length

o Start/Stop option

o Select training mode

o Records # of markers heard

o Notifies user when to give reinforcement

Notification type in user settings

o User can name session

Selects a sub category

o Training report

Plotted on a graph

Average RPM total

Average RPM per mode

Lag time

o Data saved in user history

• Multiple customizable profiles for multi-dog users

o Ability to select dog from list of profiles

• Share training data

o With admin

o Via FB and TW

• User settings

o Choice of sounds clips

o Random distraction on/off

• Training tips

o Based upon user history

• Notifications

o Internal daily alert

• Menu

o Ratio Training

o Interval Training

o Training coach

6 Ds

Charging the Marker

Explanation of schedules of reinforcement

Demo Video

o History

o Settings