

# Committee Meeting

(June 2024)

## **RAT ULTRASONIC VOCALIZATION CALL TYPES ASSOCIATED WITH LEARNING USING ELECTRICAL STIMULATION OF THE BRAIN AS A REINFORCER**

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# Pilot Study Review

After detailed analysis of the performance of three (non-naïve) rats in the three experiments, it was determined to consider:

- Large variation across subjects
  - In the number of 50-kHz ultrasonic vocalizations
  - In the consistency of vocalizations across days
  - In the number of nose-pokes for stimulation
- To attain reliable results these adjustments were decided upon:
  - Run two cohorts of 6 rats
  - Test rats every day (not every second day)
  - Revise experiment 3 with longer inter-trial intervals
  - Only one person to do behavioral tests

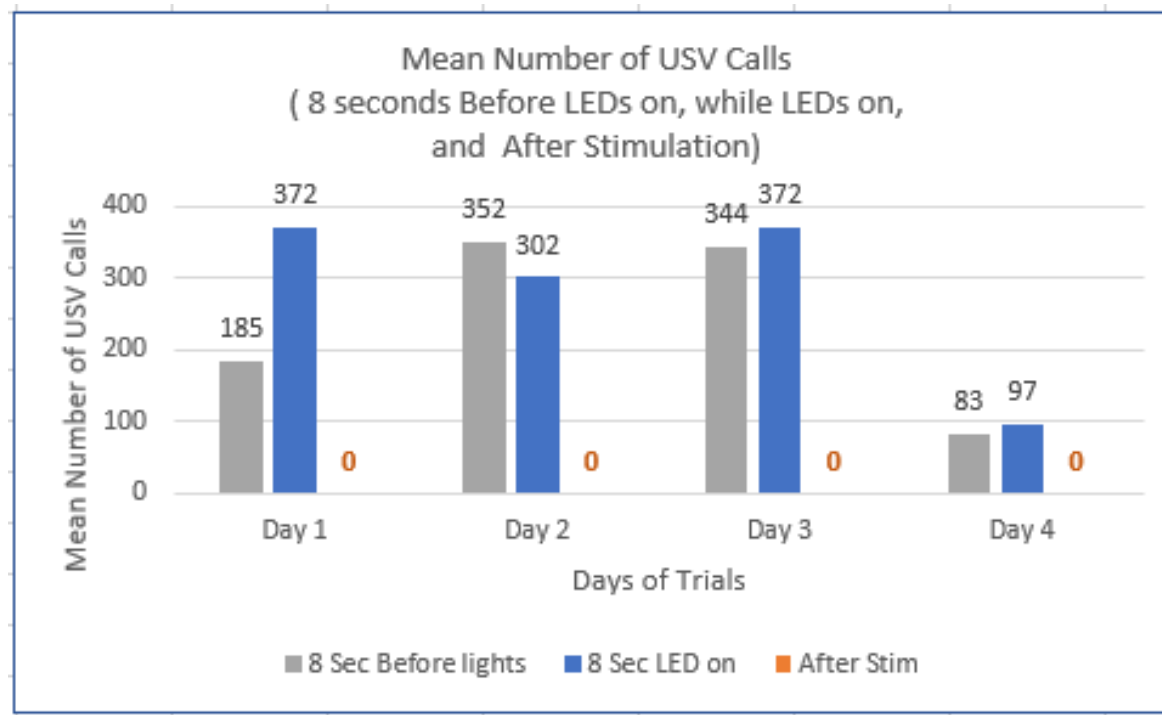
# Experiment 1

- The “drop-off” for day 4 data is because of a fewer number of USVs calls by rats 1 & 3 (mostly Rat #1)
- Performance on days and individual difference show-up more with the small number of subjects

	Rat 1	Rat 2	Rat 3			Mean Calls
Day 1	0	0	0		Day 1	0
Day 2	16	183	135		Day 2	111
Day 3	137	193	324		Day 3	218
Day 4	18	212	187		Day 4	139

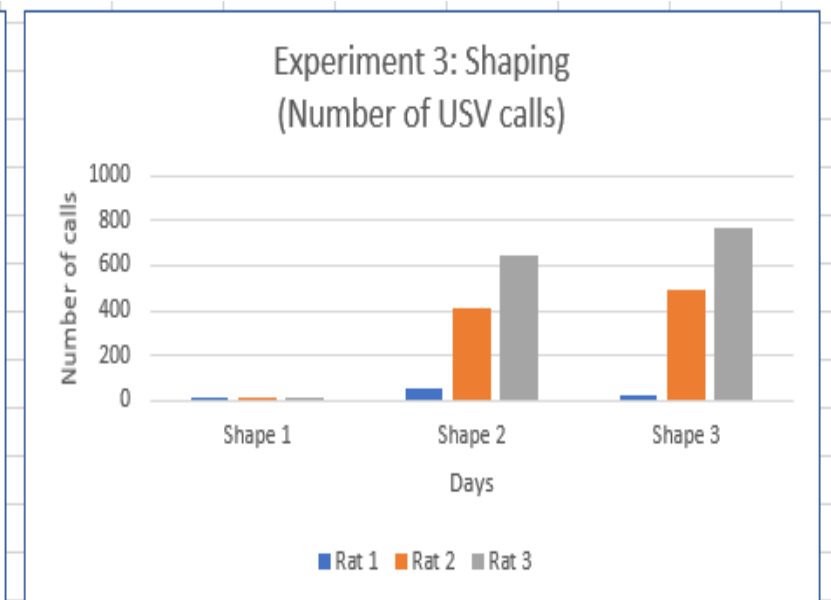
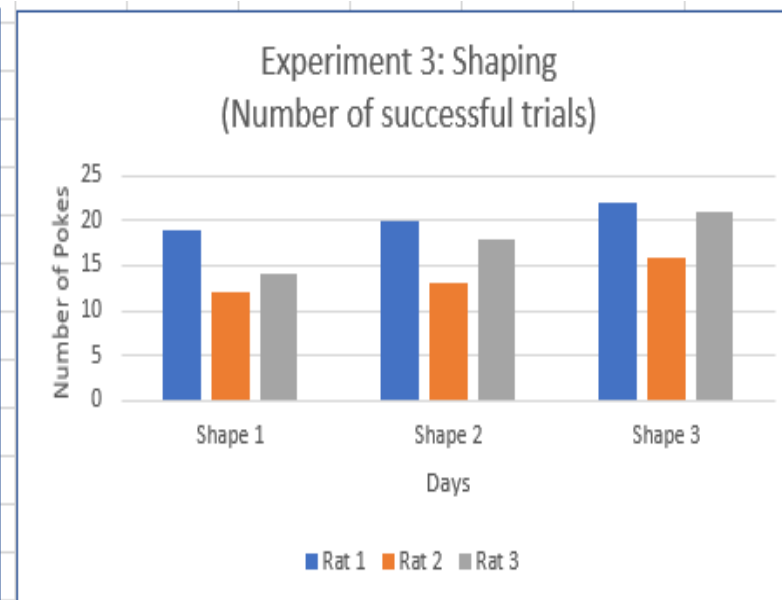
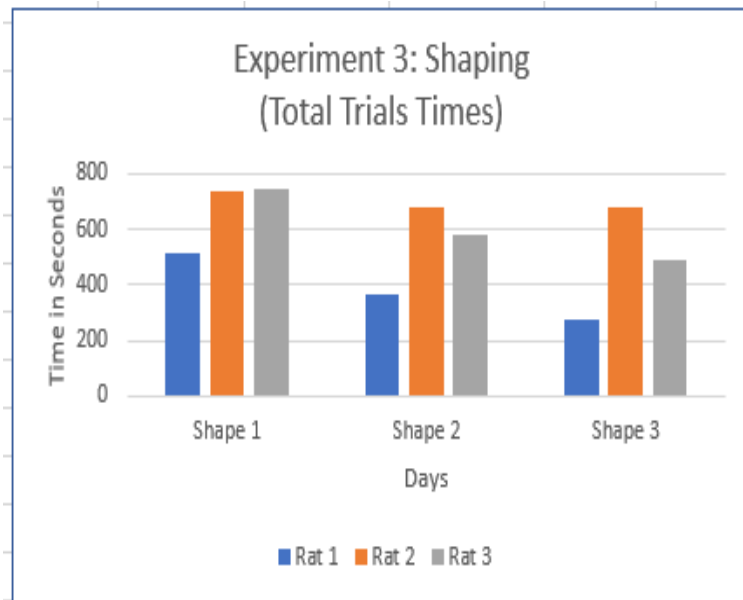
# Experiment 2

- Pairing LED lights with ESB of MFB – LEDs randomly presented for 40 trials within 90 second time window
- The LEDs are on for 8 seconds and ESB to MFB follows LEDs off



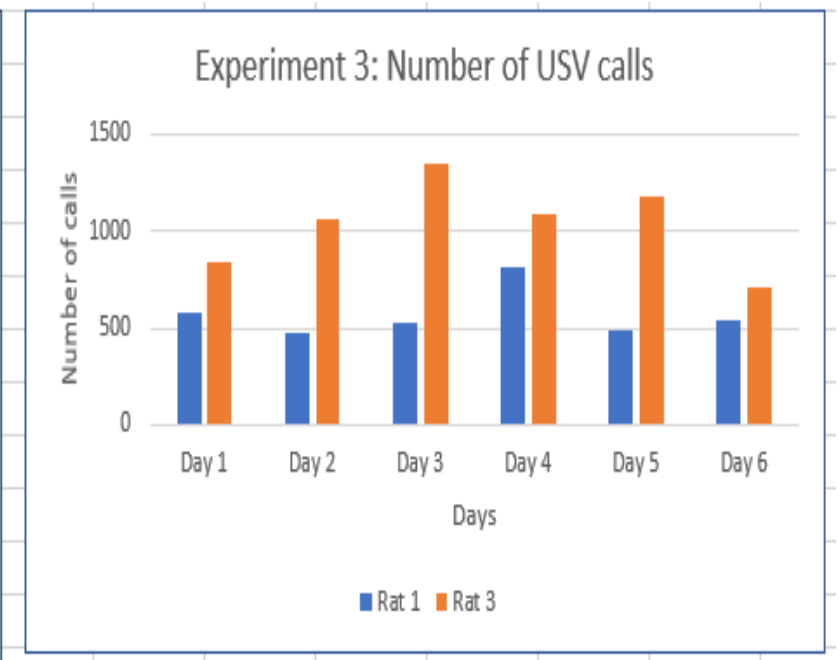
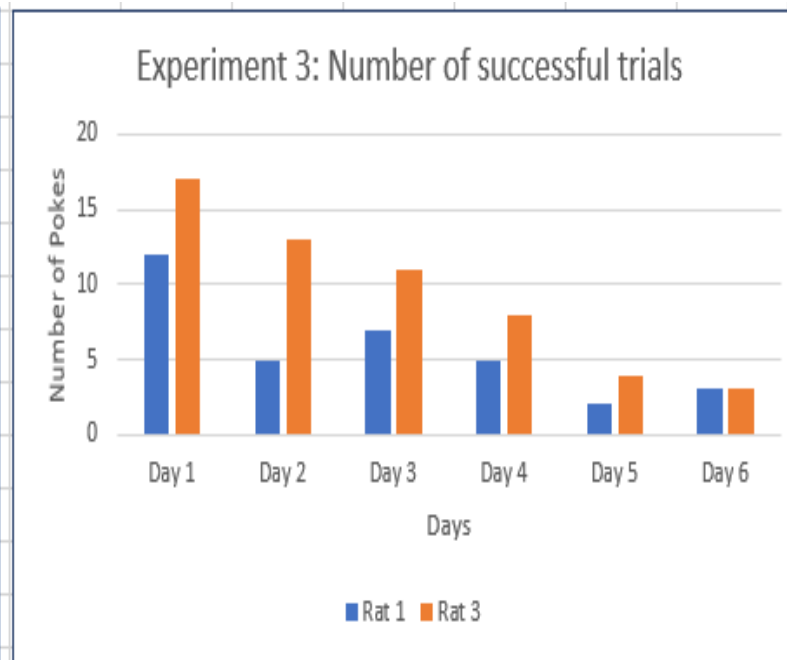
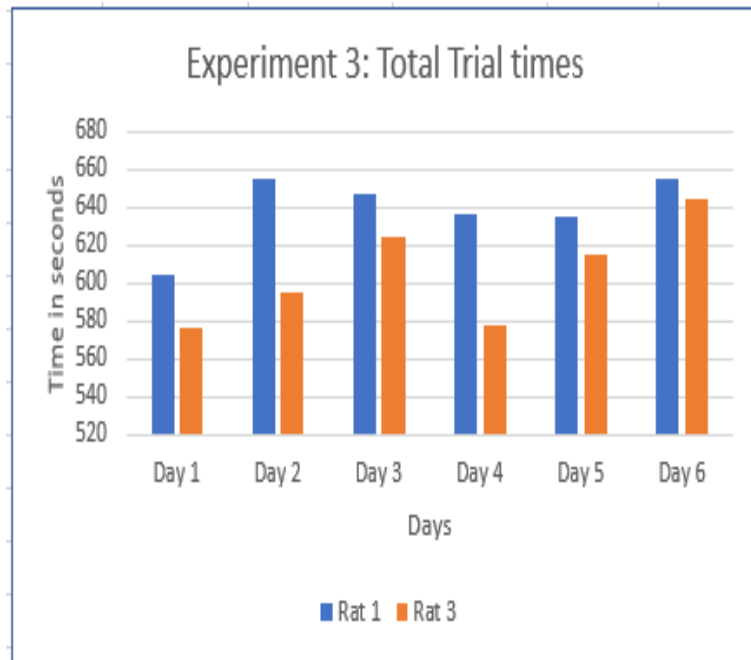
# Experiment 3

- Three days of shaping where stimulation was presented when subject nose pokes box B or C and then can go to box A for more stimulation



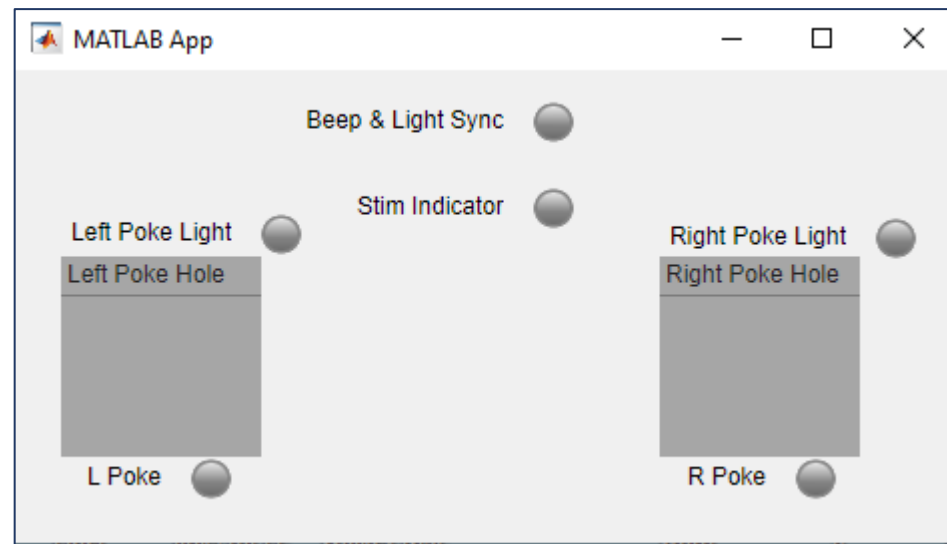
# Experiment 3

- Test days where subject pokes B or C (no stimulation) and then can go to box A for stimulation



# Revised Experiment 3

- Nose-poke ports A or B has a 30 to 50 second random inter-trial interval
- The LED flashes in port A or B for 60 seconds
- Stimulation is available while LED flashing in poke box
- If no nose poke within 60 seconds, then timed out score



# Extension for Fall 2024 to Summer 2025

- In the coming year we will acquire more subjects, this time naïve rats, and repeat the procedures with modifications
- I will have a surgical assistant to monitor the rats but will do the behavioral testing without an assistant
- I would appreciate your support for an extension to my Masters work

