Monkey See, Monkey Do: Utilizing Mimicry to Increase the Efficiency of Training Captive Cynomolgus Macaques (*Macaca fascicularis*)

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Introduction

- Operant Conditioning: PRT in captive animal research colonies
- Tools that assist in training:
  - Shaping/Successive Approximation
  - Modeling
  - Capturing/Scanning
  - Acclimation/Habituation
  - Desensitization
  - **Mimicry**

Introduction

- Mimicry
  - Learning through Observation
  - Some species are better at this than others
    - Dolphins
    - Cats
    - **NHPs**

Research Questions

- Does mimicry have an effect on PRT of cynomolgus macaques?
- Can it decrease the amount of training sessions needed to train macaques to target to a target wand?
- Can it decrease the amount of training sessions needed to train macaques to target to a stationary target?
- Will this make PRT of macaques more efficient in an animal facility?

Methods

- Group 1 (teachers/models)
    - 10 adult male Mauritius cynomolgus macaques
    - Single housed (left side of room), naïve to training, **NO mirrors**
- Group 2 (learners/mimics)
    - 10 adult male Mauritius cynomolgus macaques
    - Single housed (right side of room), naïve to training, **had mirrors**

Methods

- 2 basic PRT tasks:
  - Target to a target wand
  - Target to a stationary target
- Removed mirrors from Group 1 and started training them first
- Group 2 kept mirrors and training began once 80% of Group 1 were trained
- All training sessions = 5 mins. or less per animal

Methods: Target Wand

- Training Protocol
  - Condition animal to clicker
  - **Cue "Target", and reinforce for touching target wand**

Methods: Target Wand

Training Protocol

- Condition animal to clicker
- Cue "Target" and reinforce for touching target wand

- **Move target wand to different locations**

Methods: Target Wand

Training Protocol

- Condition animal to clicker
- Cue "Target" and reinforce for touching target wand
- Move target wand to different locations
- **Non-trainer cues animal**

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Methods: *Stationary Target*

- Training Protocol
  - Cue "Target", and reinforce for touching stationary target
  - **Cue "Hands", and reinforce for touching stationary target**

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Methods: *Stationary Target*

- Training Protocol
  - Cue "Target", and reinforce for touching stationary target
  - Cue "Hands", and reinforce for touching stationary target
  - Move stationary target to different locations
  - **Non-trainer cues animal**

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Methods

Training Sessions are recorded as follows:

- Target Wand OR Stationary Target Training
  - 0%=Not trained
  - 10%=Bridge trained
  - 20%=Looks at target
  - 30%=Moves towards target
  - 40%=Touches target with bribe on it
  - 50%=Touches target with hand/mouth inconsistently
  - 70%=Touches target with hand/mouth consistently
  - 80%=Touches target in 3 different locations inconsistently
  - 90%= Touches target in 3 different locations consistently
  - 100%=Touches target in 3 different locations consistently with someone other than the trainer
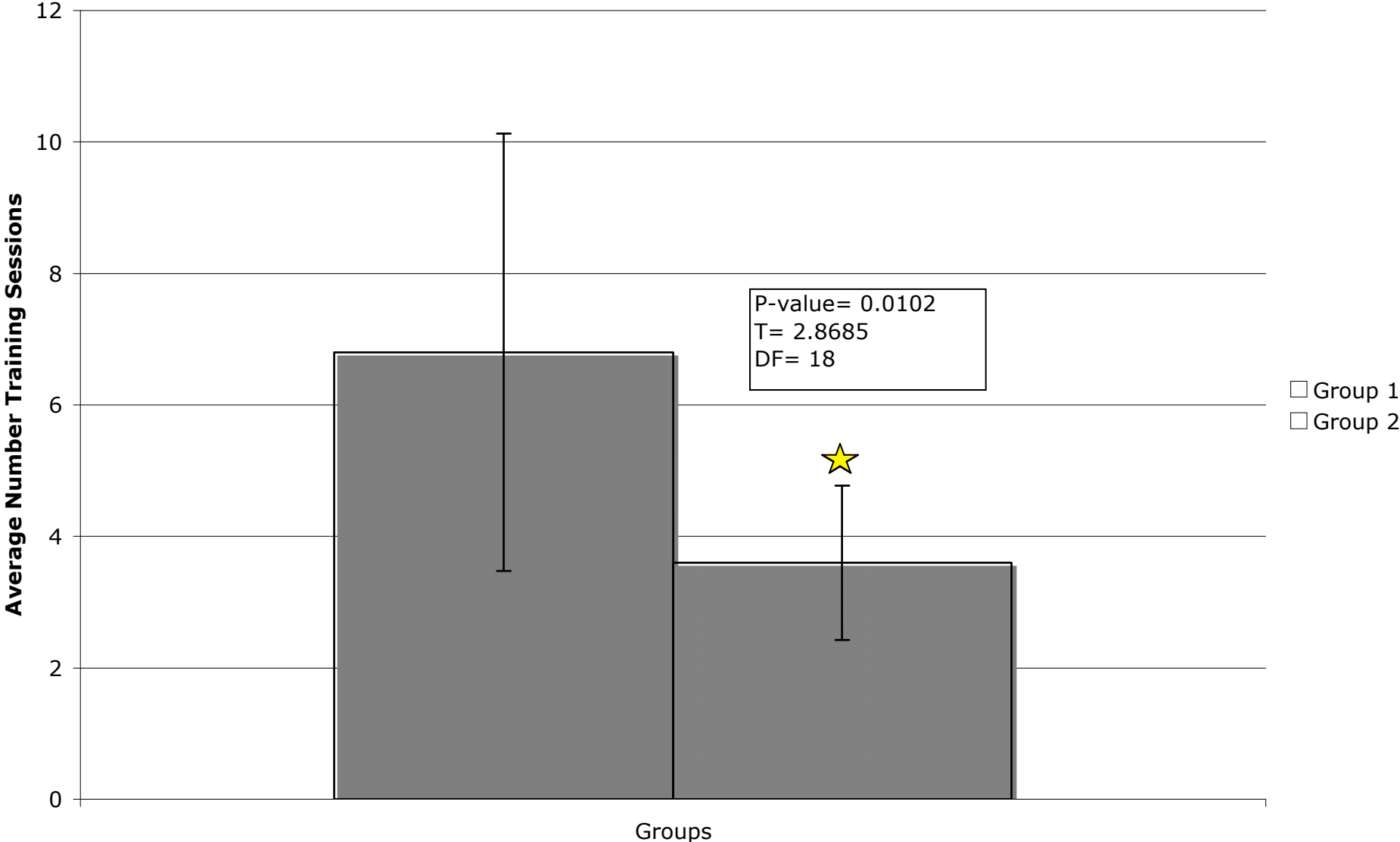
Results

- Group 1
  - Target Wand
    - All 10 macaques were 100% trained within a mean of 6.8 training sessions.
    - Max. total time spent training = 340 mins.
  - Stationary Target
    - All 10 macaques were 100% trained within a mean of 4.6 training sessions.
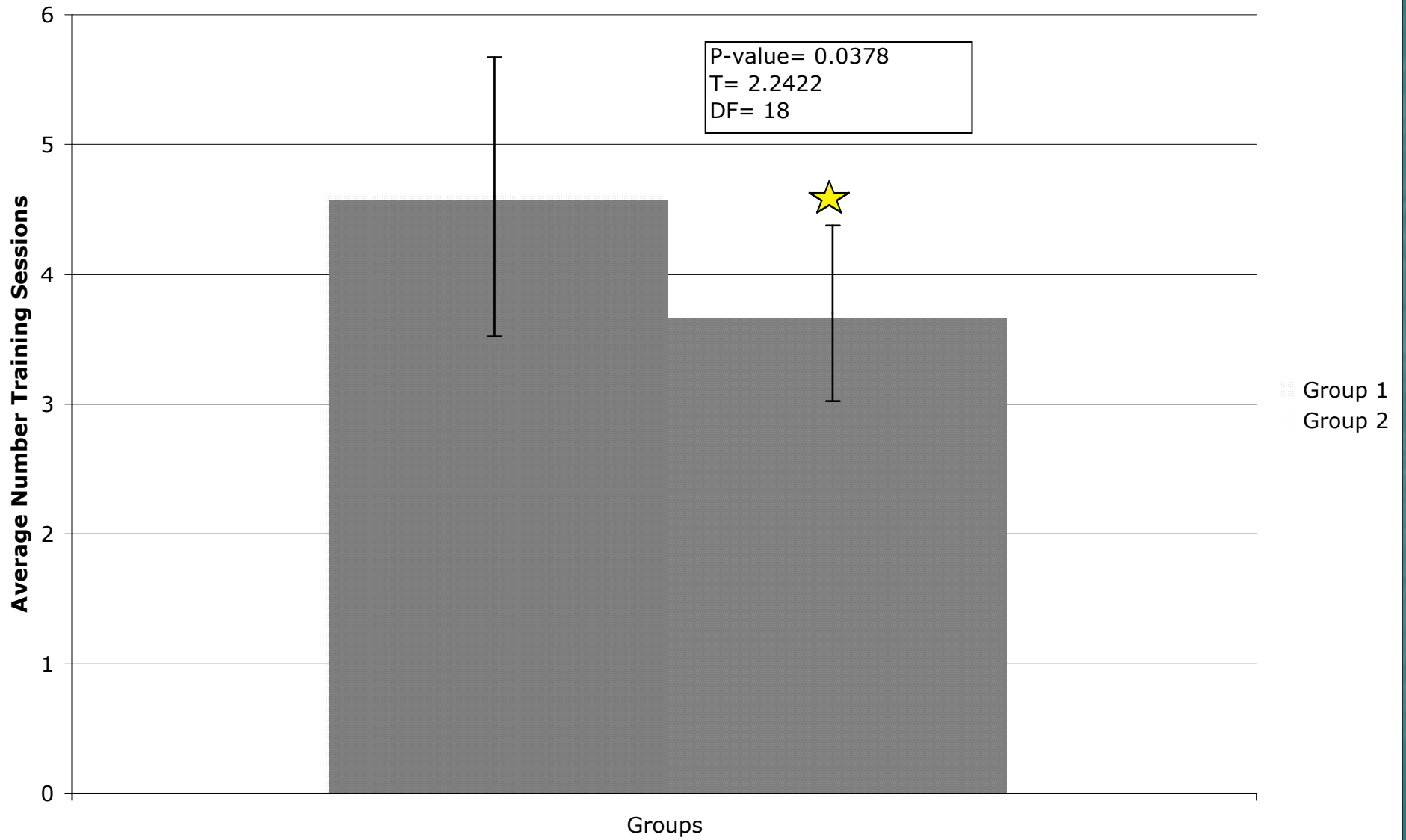   - Max. total time spent training = 230 mins.

Results

- Group 2
  - Target Wand
    - All 10 macaques were 100% trained within a mean of 3.6 training sessions.
    - Max. total time spent training = 180 mins.
  - Stationary Target
    - All 10 macaques were 100% trained within a mean of 3.7 training sessions.
    - Max. total time spent training = 185 mins.

Comparison of Average Target Wand Training Sessions

Average Number Training Sessions

P-value= 0.0102
T= 2.8685
DF= 18

Group 1
Group 2

Groups

Comparison of Average Stationary Target Trainings Sessions

P-value= 0.0378
T= 2.2422
DF= 18

Average Number Training Sessions

Groups

Group 1
Group 2

Discussion

- Does mimicry have an effect on PRT of cynomolgus macaques? **YES**

- Does it decrease the amount of training sessions needed to train macaques to target to a target wand? **YES**

- Does it decrease the amount of training sessions needed to train macaques to target to a stationary target? **YES**

Discussion

- Will training this way make PRT of macaques more efficient in an animal facility?
  - Our data suggests that by training only one side of a room until 80% of these animals are trained, and then training the other side of the room, that this will decrease the total amount of time spent training when compared to training all animals on both sides of the room from the beginning.

- Future… larger sample size with exact amount of time per training session noted

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