Laser Lixit™ Training: An Alternative Form of Target Training that can be Utilized in the Daily Husbandry Care of Rhesus Macaques (*Macaca mulatta*) and Cynomolgus Macaques (*Macaca fascicularis*)

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Introduction

- Non-human primate research is rewarding and challenging.
- Safety and Efficiency of facilities is important.
- Animal cooperation is key.

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Introduction

- Operant Conditioning is useful and successful at gaining cooperation from primates for various tasks.
  - Animal Movements
  - Bio-product Collection
  - Drug Administration
  - **Daily Husbandry Care**

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Research Questions

- Is laser lixit™ training an efficient and effective way to check lixits™?
- Does laser lixit™ training encourage the development of “willing workers”?
- Can laser lixit™ training be built upon for future training endeavors?
- Do NHPs with previous pole and collar training experience have an advantage for laser lixit™ training over NHPs naïve to training?

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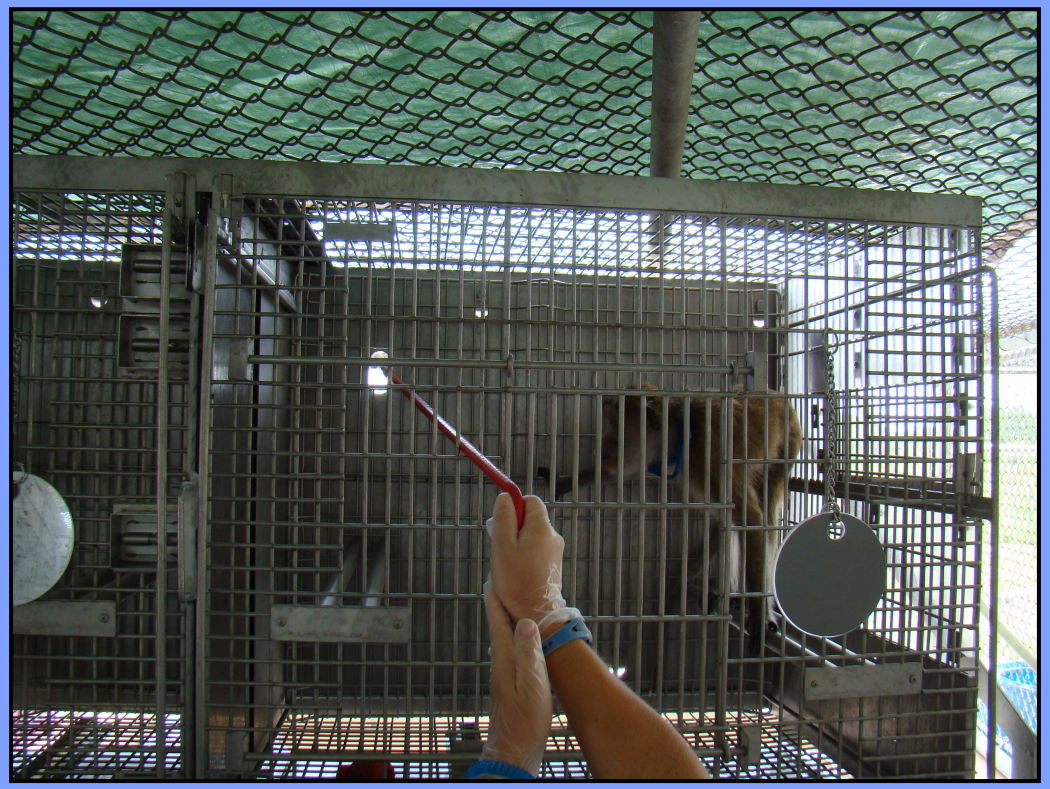
Methods

- Group Miami (Primate Products, Inc.)
  - Subjects: 8 *Macaca mulatta* (6 males and 2 females) and 7 *Macaca fascicularis* (4 males and 3 females)
  - Single housed, naïve to training
- Group PTLC (Primate Products, Inc.)
  - Subjects: 8 *Macaca fascicularis* (all male)
  - Single housed, pole and collar trained

Methods

- Prior to training, basic lixit™ checking with lixit™ stick is timed per animal



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Methods

- Training Protocol
  - **Condition animal to clicker**

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Methods

- Training Protocol
  - Condition animal to clicker
  - **Introduce laser point on cage**

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Methods

- Training Protocol
  - Condition animal to clicker
  - Introduce laser point on cage
  - **Reinforce for touching laser point**

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Methods

- Training Protocol
  - Condition animal to clicker
  - Introduce laser point on cage
  - Reinforce for touching laser point
  - **Move laser point to lixit™ and reinforce**

Methods

- Training Protocol
  - Condition animal to clicker
  - Introduce laser point on cage
  - Reinforce for touching laser point
  - Move laser point to lixit™ and reinforce
  - **Reinforce for water release from lixit™**
- Training sessions = 5 mins. or less per animal

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QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.

Methods

Training Sessions are recorded as follows:

- 0%=Not trained
- 20%=Look at laser point
- 40%=Touch cage side inconsistently
- 50%=Touch cage side consistently
- 70%=Touch lixit™ without H2O inconsistently
- 90%=Touch lixit™ with H2O inconsistently

- 10%=Bridge conditioned
- 30%=Move toward laser point
- 45%=Touch cage back inconsistently
- 60%=Touch cage back consistently
- 80%=Touch lixit™ without H2O consistently
- 100%=Touch lixit™ with H2O consistently

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Results

- Group Miami
  - 7 out of 8 *M. mulatta* were 100% trained within a mean of 4.57 training sessions
  - 6 out of 7 *M. fascicularis* were 100% trained within a mean of 4 training sessions

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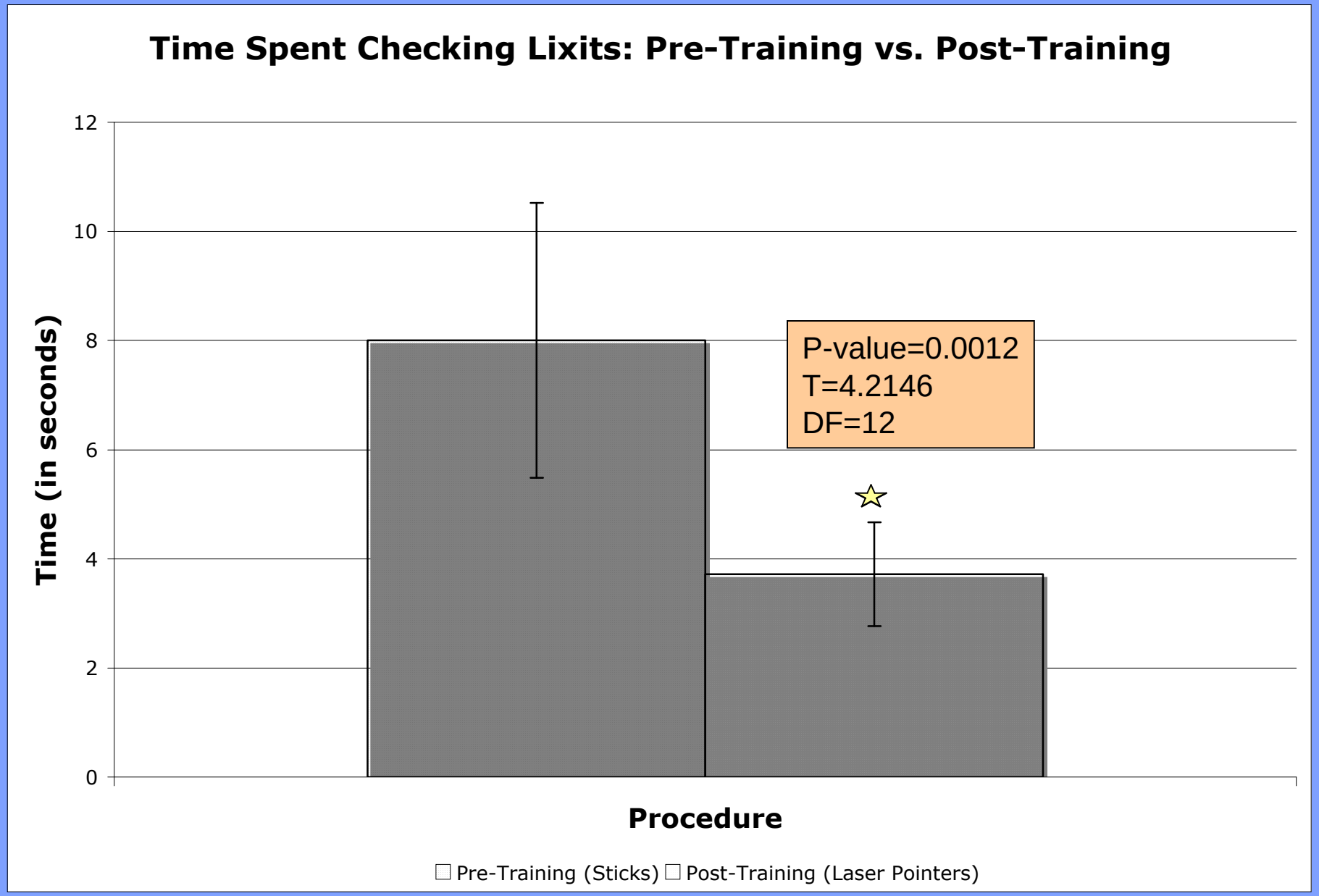
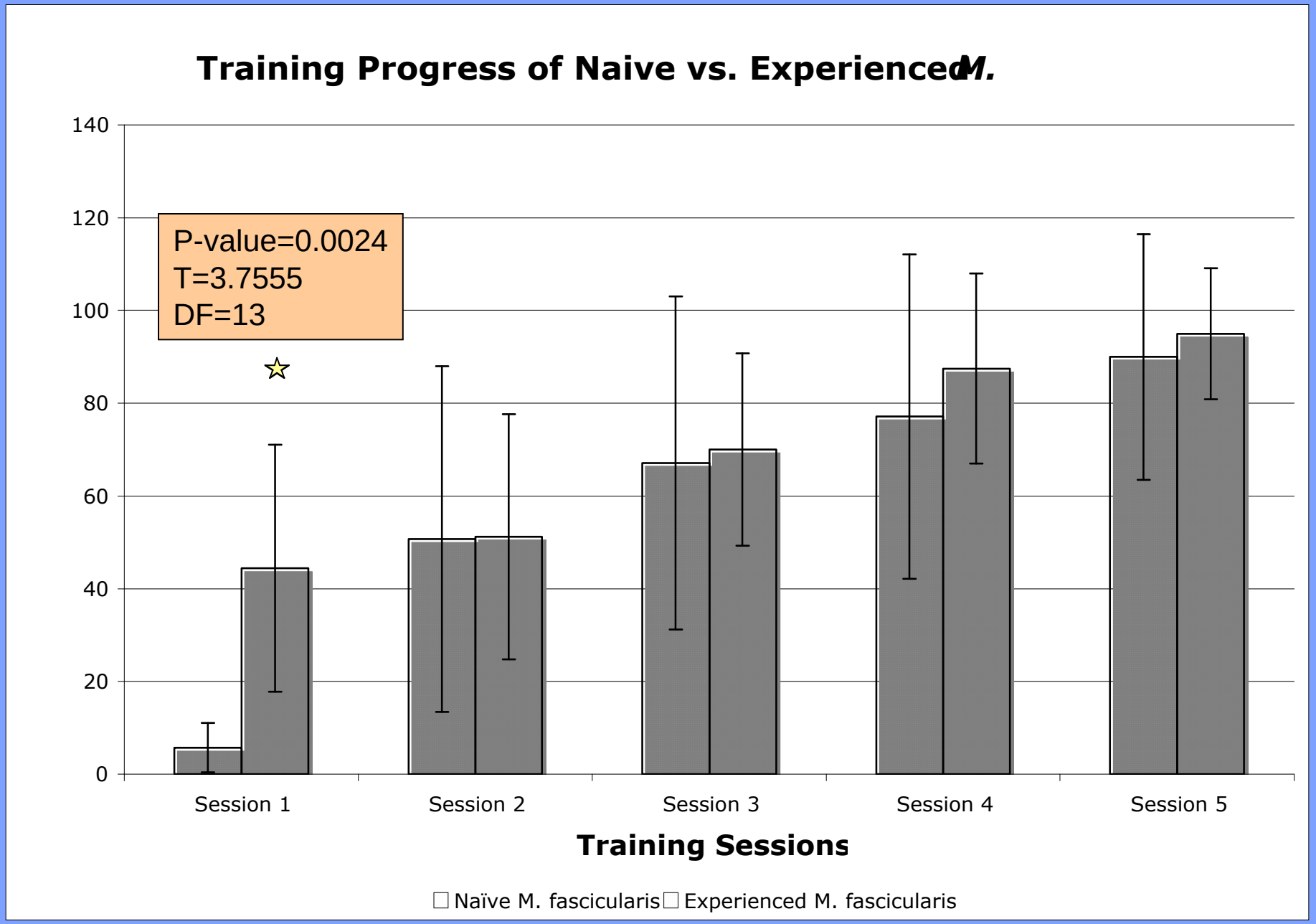
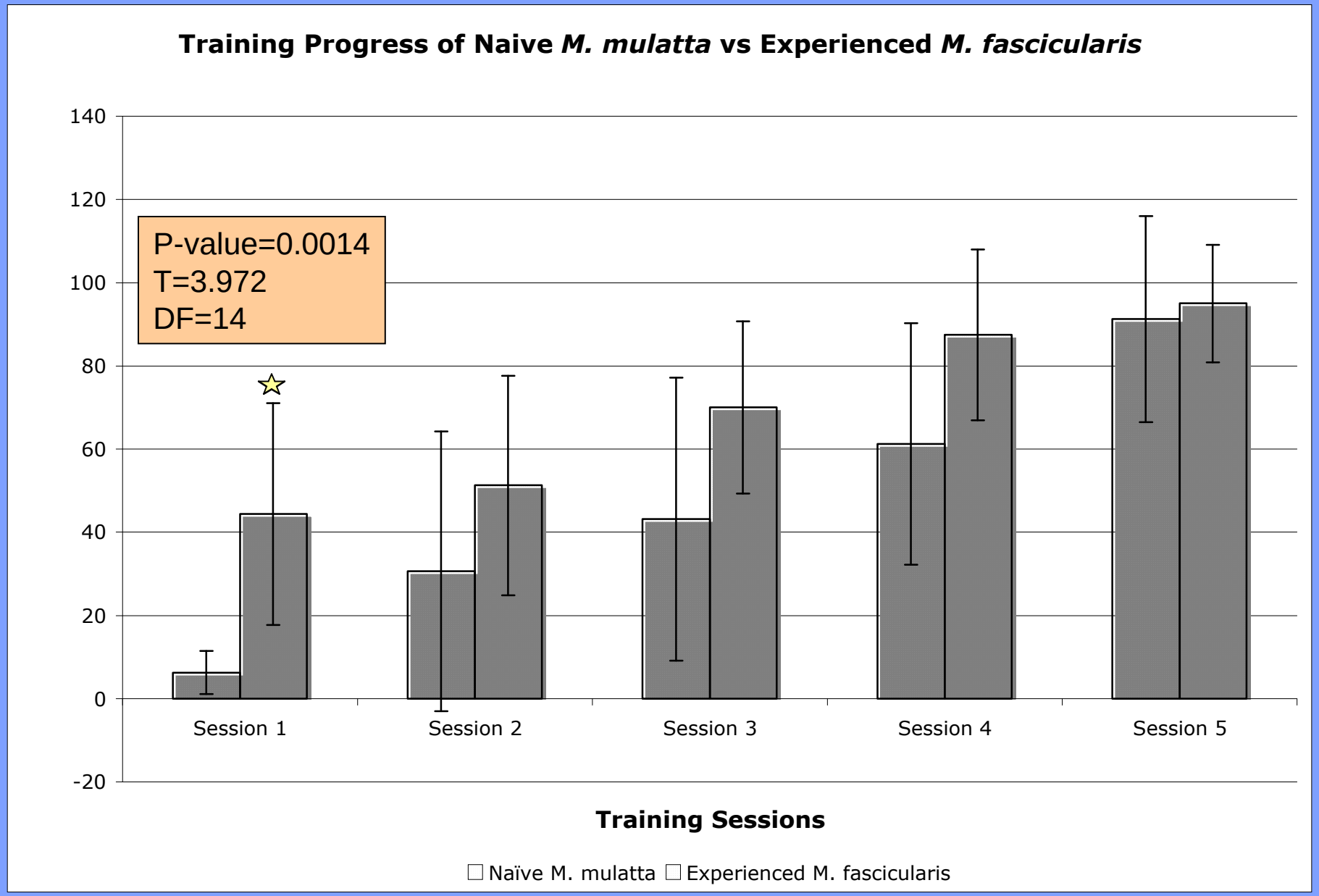
Results

- Group PTLC
  - 7 out of 8 *M. fascicularis* were 100% trained within a mean of 4 training sessions.
  - Average time spent checking lixits™
    - Pre-Training (sticks) = 8 seconds
    - **Post-Training (laser pointers) = 3.71 seconds**


Time Spent Checking Lixits: Pre-Training vs. Post-Training
12
10
8
6
4
2
0
Time (in seconds)
P-value=0.0012
T=4.2146
DF=12
Procedure
Pre-Training (Sticks)
Post-Training (Laser Pointers)


Training Progress of Naive vs. Experienced M.
140
120
100
80
60
40
20
0
P-value=0.0024
T=3.7555
DF=13
Session 1
Session 2
Session 3
Session 4
Session 5
Training Sessions
Naïve M. fascicularis
Experienced M. fascicularis


Training Progress of Naive M. mulatta vs Experienced M. fascicularis
140
120
100
80
60
40
20
0
-20
P-value=0.0014
T=3.972
DF=14
Session 1
Session 2
Session 3
Session 4
Session 5
Training Sessions
Naïve M. mulatta
Experienced M. fascicularis

Discussion

- Laser lixit™ training is:
  - An efficient and effective method for checking lixits™
  - A means of developing “willing workers”
  - A building block for future training endeavors
    - Animal movements
    - Object retrieval
    - Research studies

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Discussion

- NHPs with previous pole and collar training experience do have an advantage for laser lixit™ training over NHPs that are naïve to training, but it is only significant during the 1st training session.

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Acknowledgements

- Michael Nelsen
- Joe Mark III
- Primate Products, Inc. Staff PTLC
- Primate Products, Inc. Staff Miami