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Background and approach

- Sign-tracking (ST) and goal-tracking (GT) rats are characterized by their cue or reward directed behaviors in a Pavlovian lever autoshaping (PLA) task
- Male ST rats are insensitive to satiety devaluation but become sensitive after extended training in PLA
- Female rats show enhanced sign-tracking behavior and impaired devaluation sensitivity
- The Dorsomedial Striatum (DMS) regulates devaluation sensitivity
- Here we investigate the role of Cannabinoid-1 Receptor (CB1R) activity in DMS on sex-specific devaluation sensitivity of sign-tracking rats.

Sign-tracking

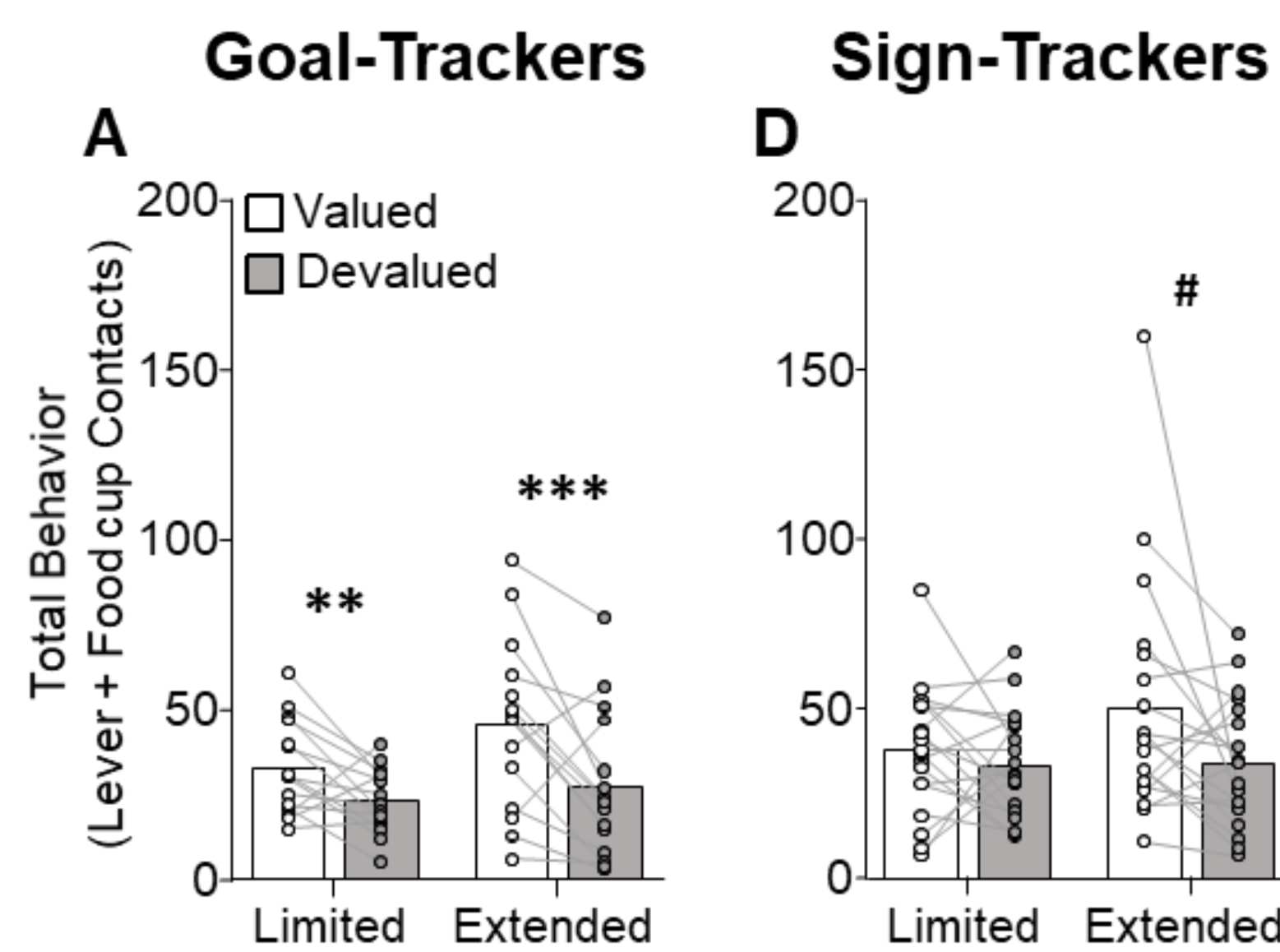


Goal-tracking



10s Lever → 2 food pellets

Male ST rats become sensitive to satiety devaluation after extended PLA training. (Keefer et. al 2020)



Goal and Sign-tracking across extended training

$$PCA \text{ index} = \frac{\text{preference score} + \text{latency score} + \text{probability score}}{3}$$

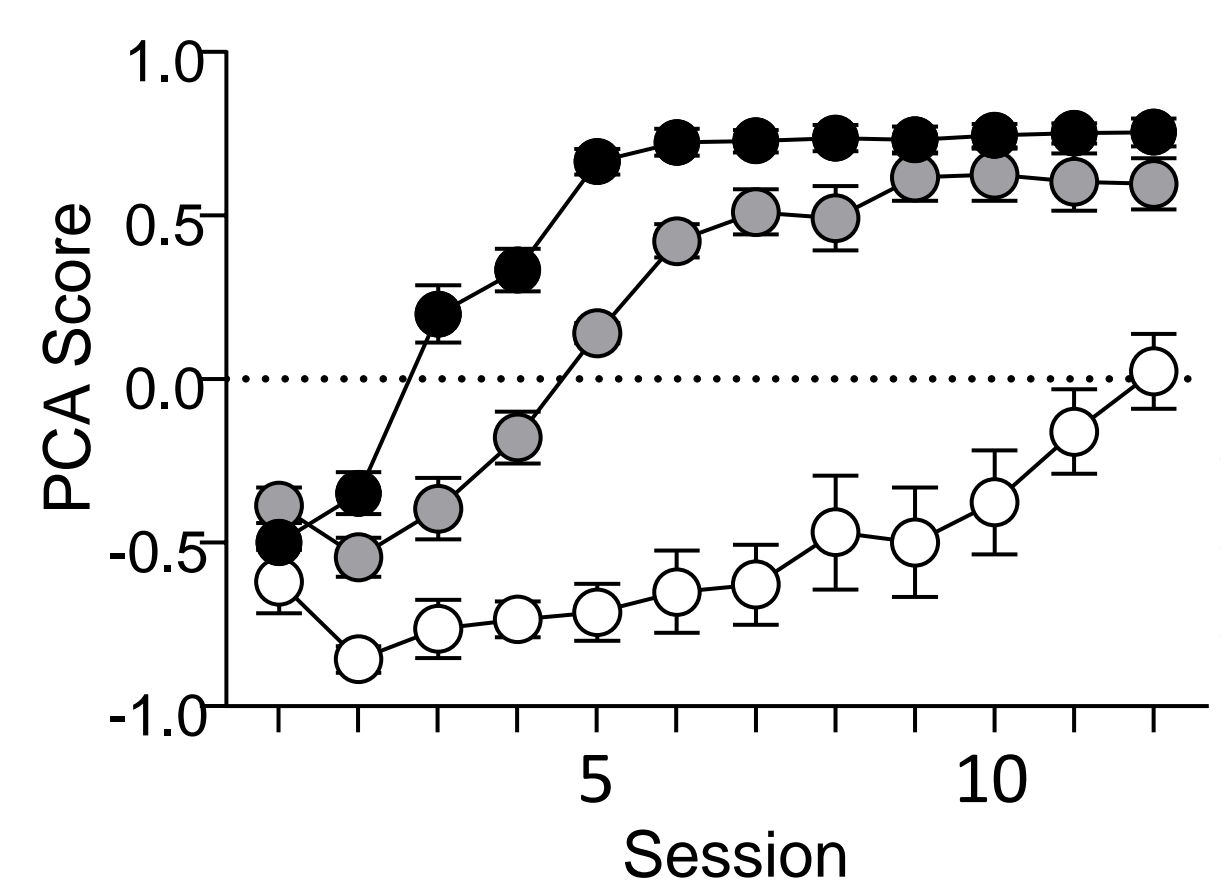
$$\text{Preference score} = \frac{\text{duration lever presses} - \text{duration food cup poke}}{\text{duration lever presses} + \text{duration food cu}}$$

$$\text{Latency score} = \frac{\text{poke latency} - \text{lever press latency}}{10 \text{ seconds (duration of cue)}}$$

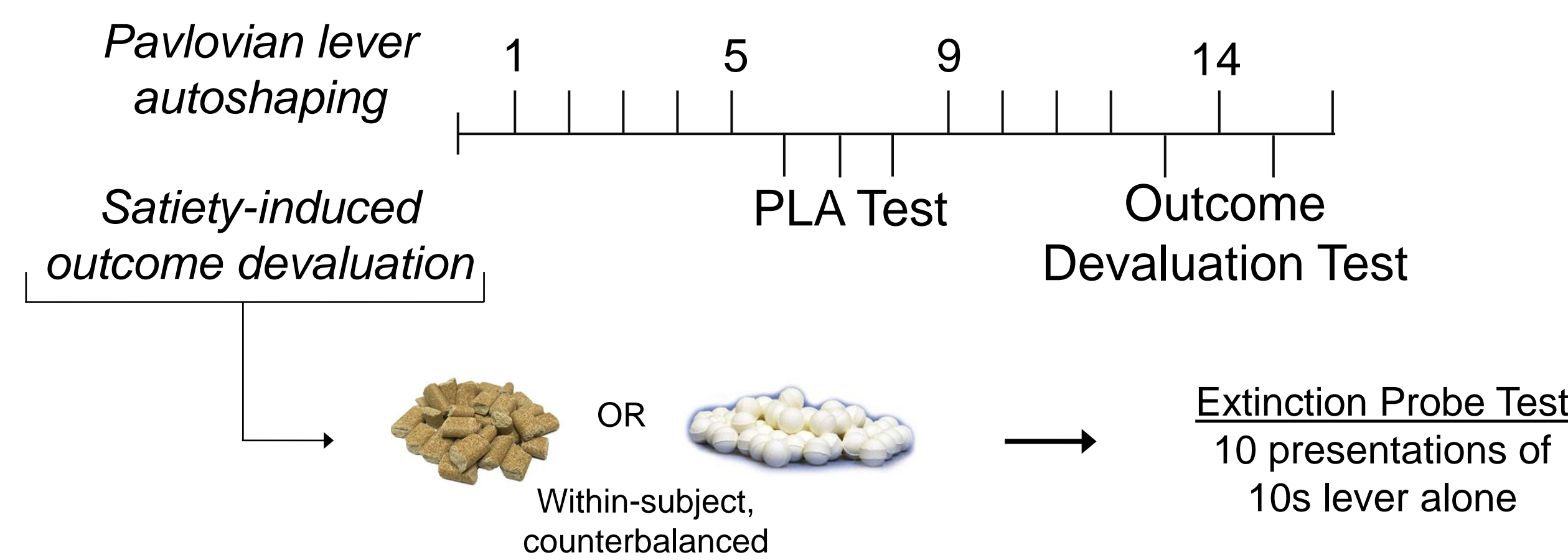
$$\text{Probability score} = \text{p(lever press)} - \text{p(food cup poke)}$$

Normalized Devaluation Responding

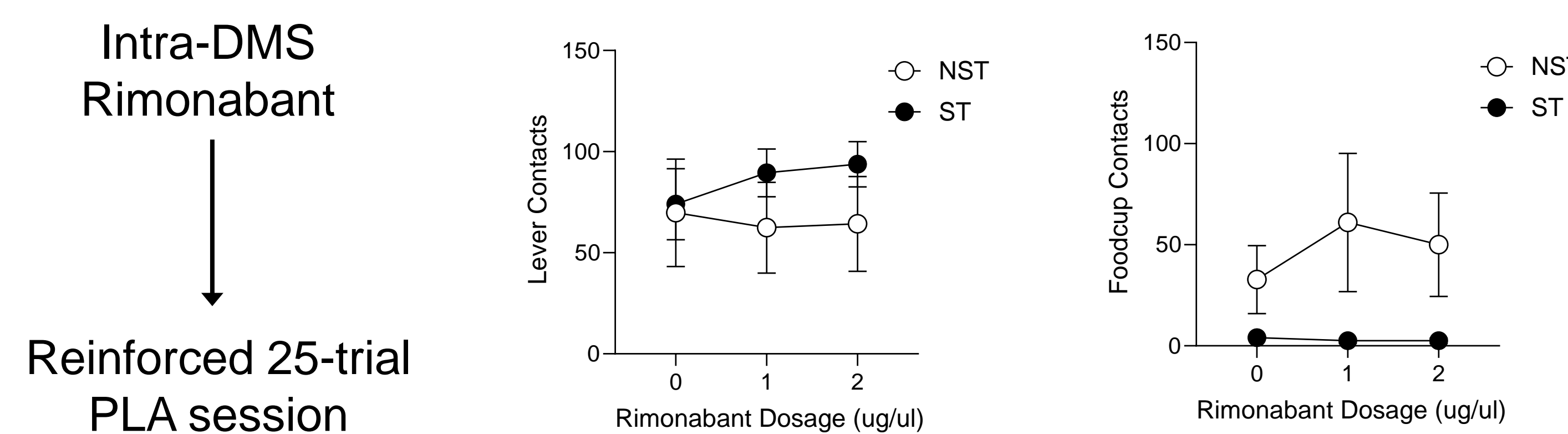
$$\text{Normalized Preferred Responding} = \frac{\text{Preferred responding during Non-devalued OR Devalued session}}{\text{Preferred responding during Non-devalued + Devalued session}}$$



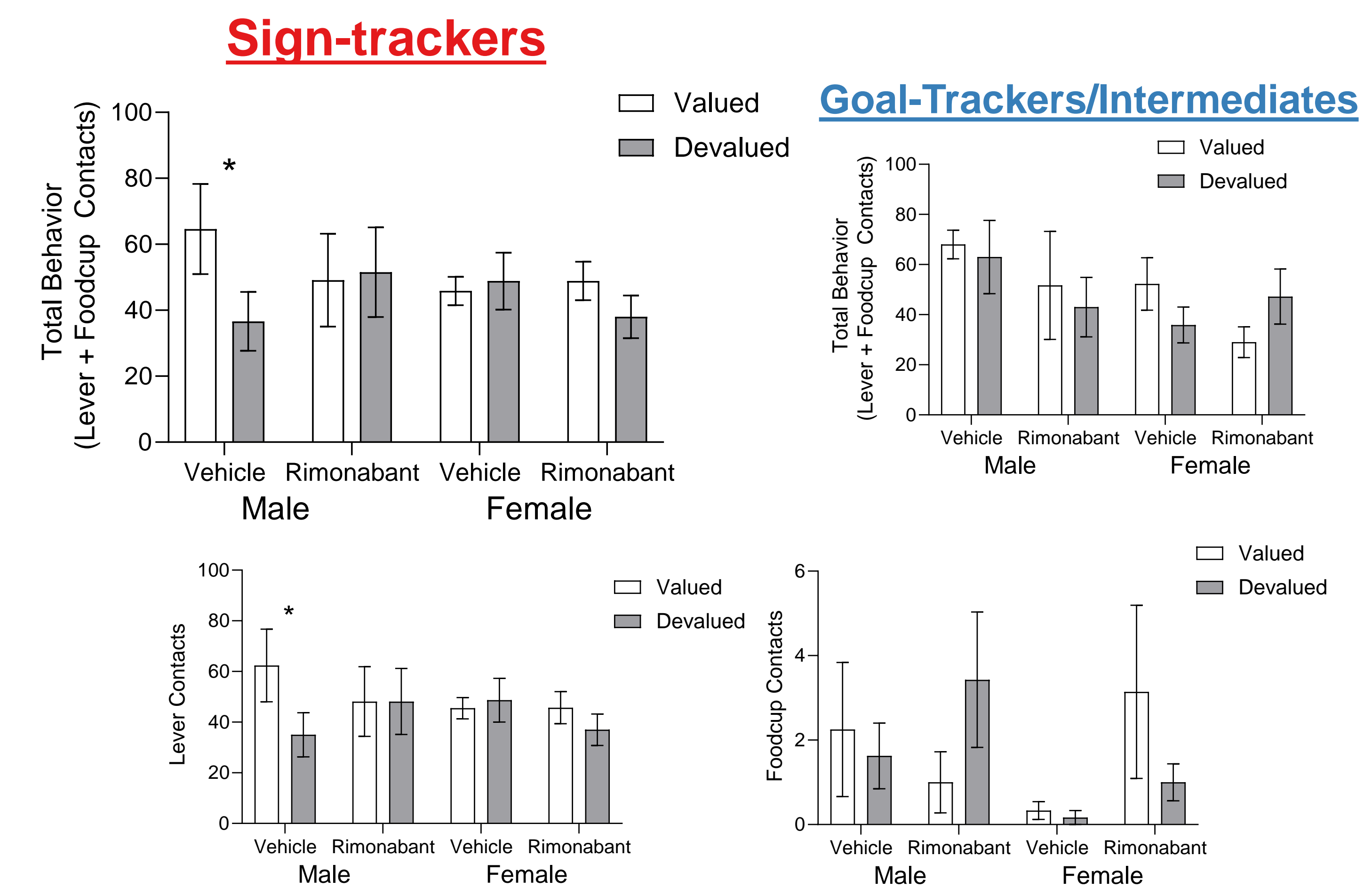
Male and Female STs differ in devaluation sensitivity after extended training



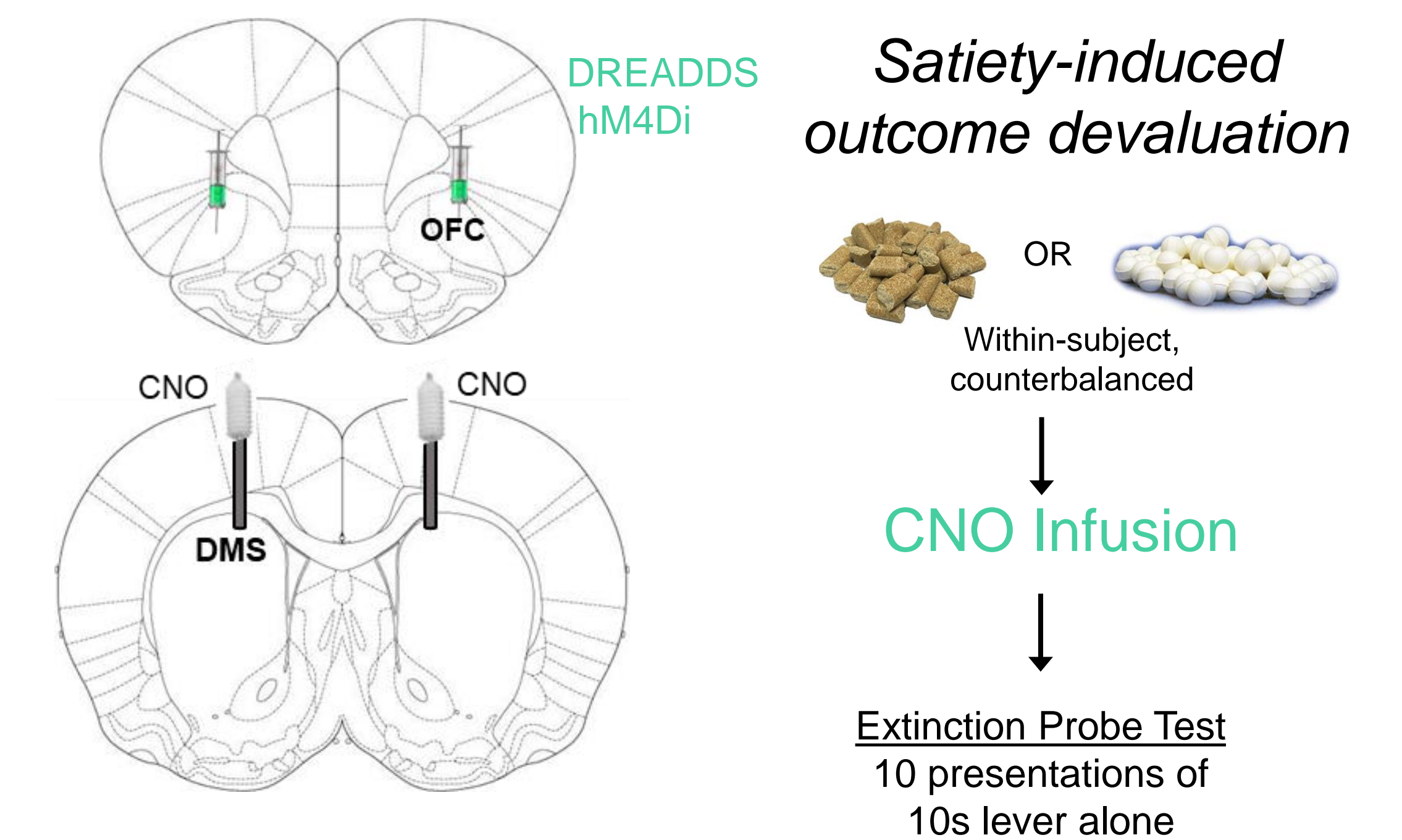
CB1 Blockade in DMS does not alter Tracking Behavior



Decreasing DMS CB1R signaling impairs devaluation sensitivity in Male ST rats



Future Directions



Conclusions

- After extended training in PLA, Male STs are devaluation sensitive while Female STs are devaluation insensitive
- Intra-DMS CB1R blockade does not affect sign- or goal-tracking behaviors in PLA
- Intra-DMS CB1R blockade impairs the devaluation sensitivity of Male STs that emerges after extended training
- Our results are consistent with prior findings that DMS CB1R signaling is necessary for devaluation sensitivity
- We hypothesize that CB1Rs act on cortical inputs (OFC) to DMS to influence male ST rats' sensitivity to devaluation that emerges after extended Pavlovian training