



Exploring the Gender Gap: Individual Differences in Impulsive Choice and Timing in Female Rats

Sarah L. Stuebing, Andrew T. Marshall, and Kimberly Kirkpatrick

Department of Psychological Sciences

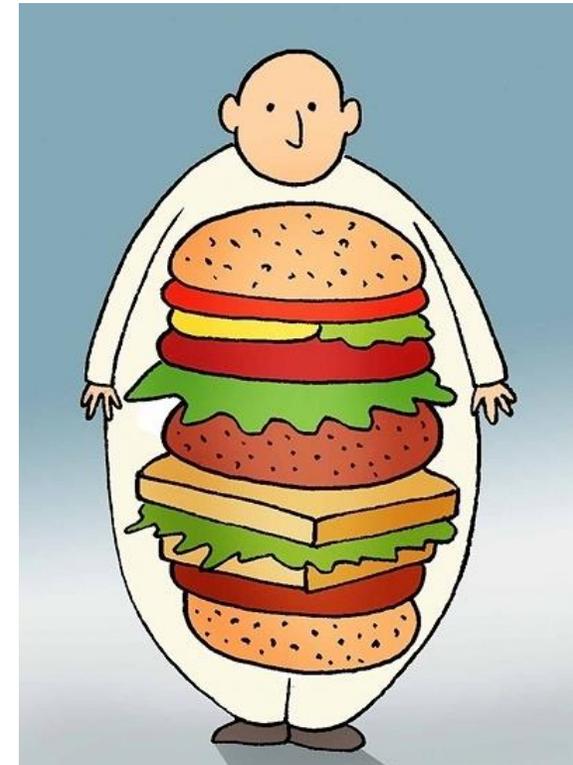
Kansas State University





Why Study Impulsive Choice?

- ▶ Impulsive choice plays a role in some maladaptive behaviors
 - ▶ obesity
 - ▶ gambling
 - ▶ substance abuse





Sex Differences

Sex differences have been described in other work

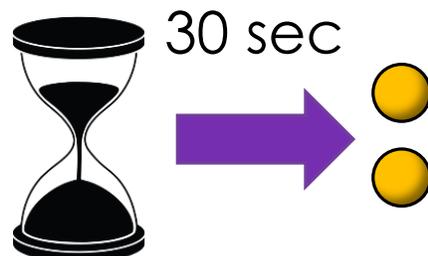
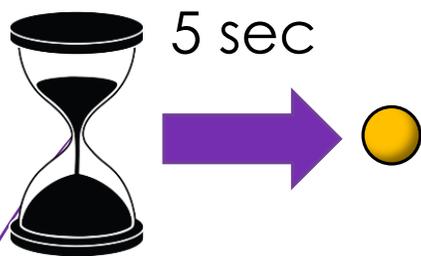
- ▶ Anker et al 2008 – female rats are more prone to impulsive in drug-seeking behavior
- ▶ Bayless and Daniel 2012 – rodent sex differences in attentional processes and inhibitory control
- ▶ Bayless and Daniel 2015 – neuroanatomical differences between male and female rats





Analysis of Female Choice and Timing

Impulsive Choice Task



10 sec

30 sec

20 sec

30 sec

Bisection Task



4, 5.26, 6.04, 6.93, 7.94, 9.12, 12 sec

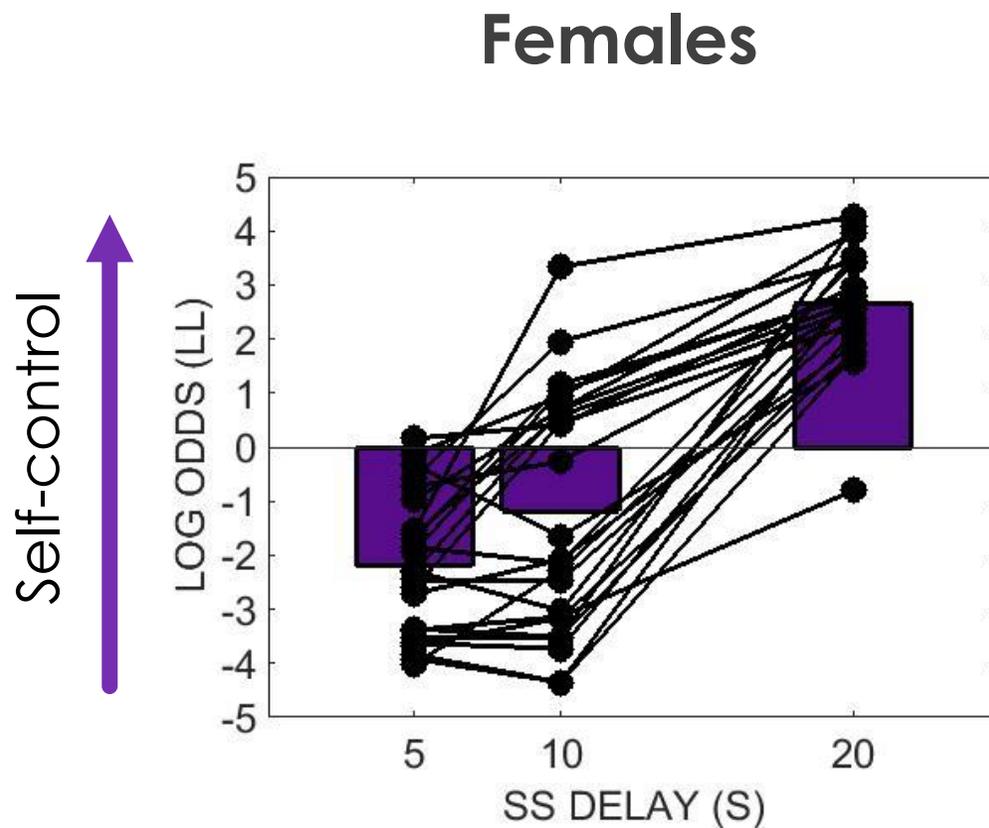
4 sec?

12 sec?

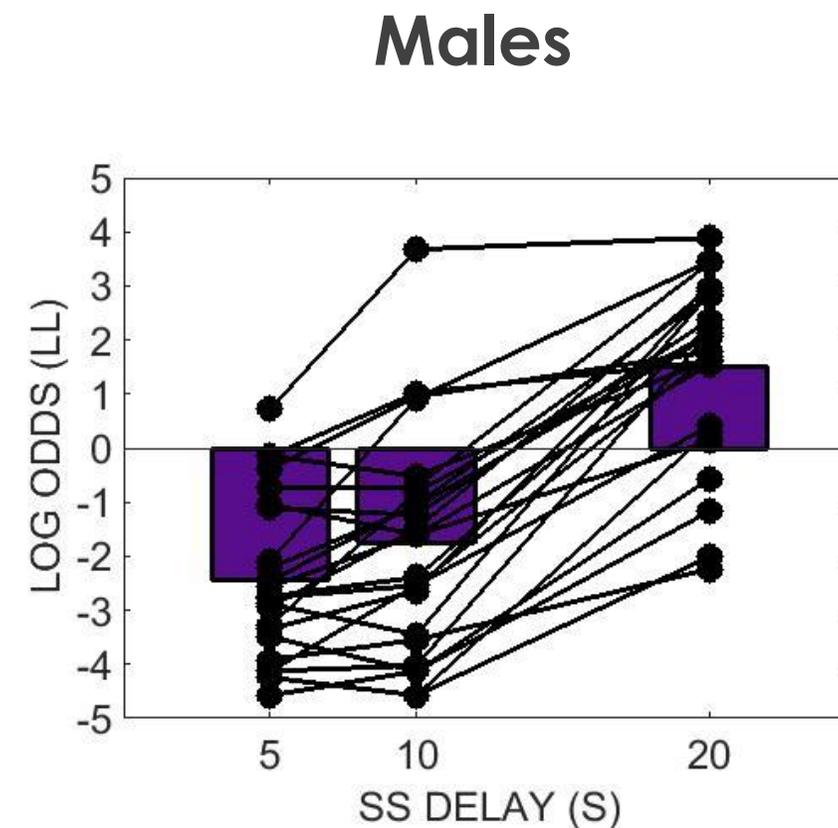




Female and Male Choice



Stuebing, Marshall, Kirkpatrick, In Prep.

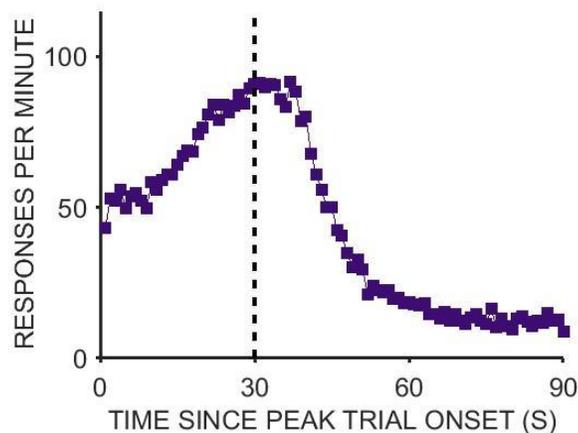
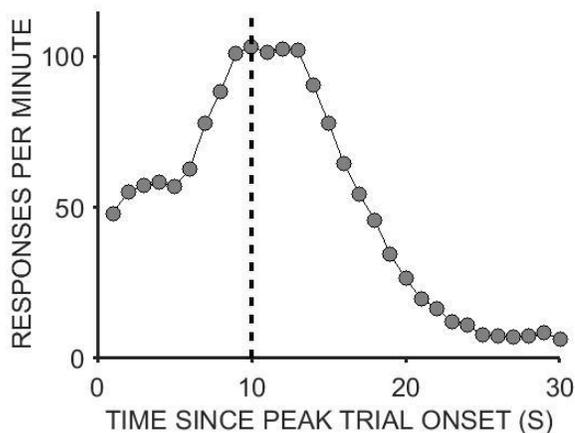


Smith, Marshall, Kirkpatrick, 2015.



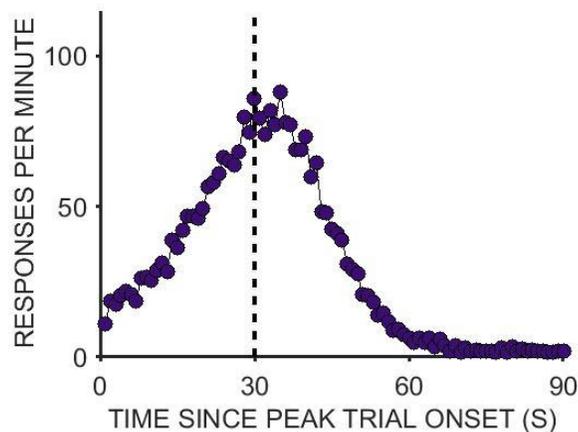
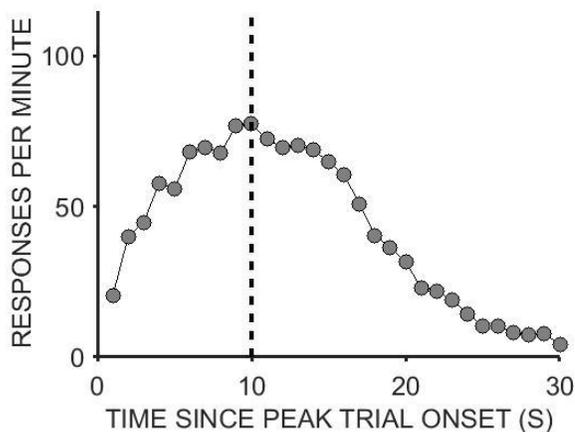


Female and Male: Choice Task Peak Responses



Female

Stuebing, Marshall,
Kirkpatrick, In Prep.



Male

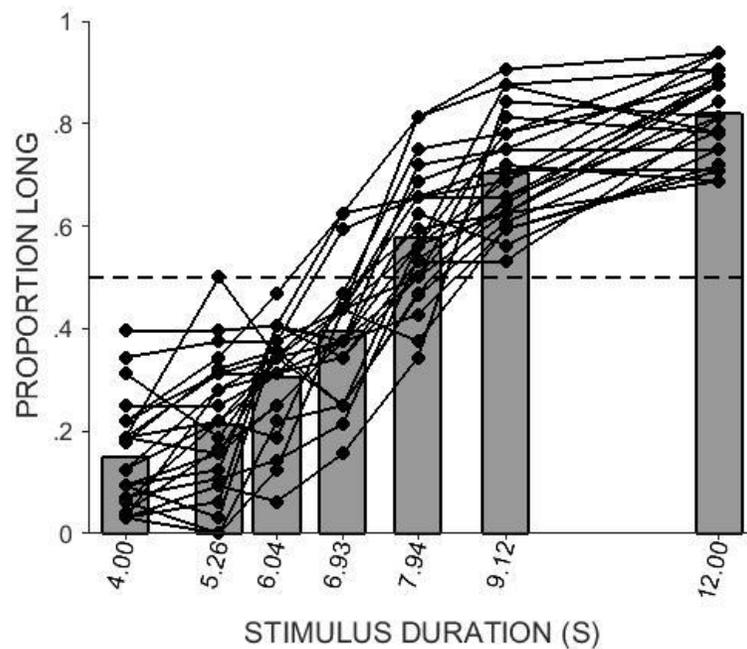
Marshall, Smith,
Kirkpatrick, 2014.





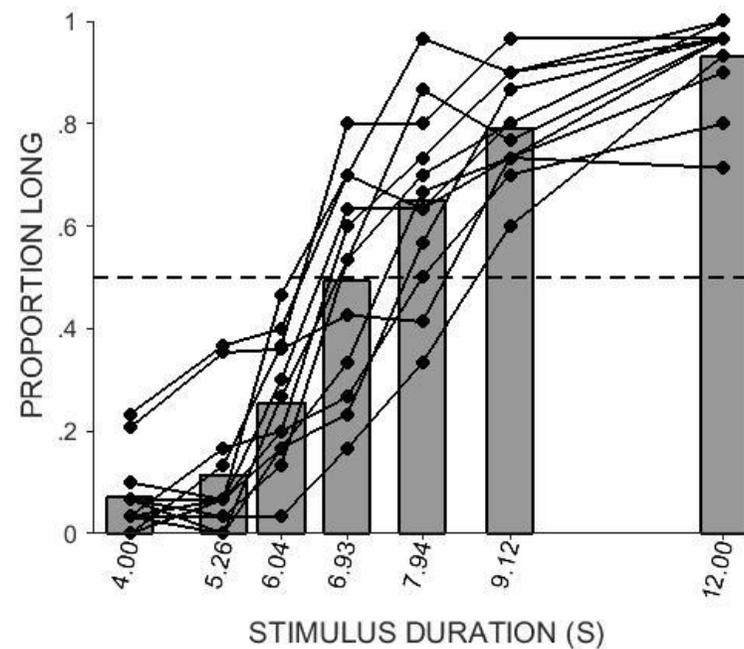
Temporal Bisection Task

Females



Stuebing, Marshall, Kirkpatrick, In Prep.

Males

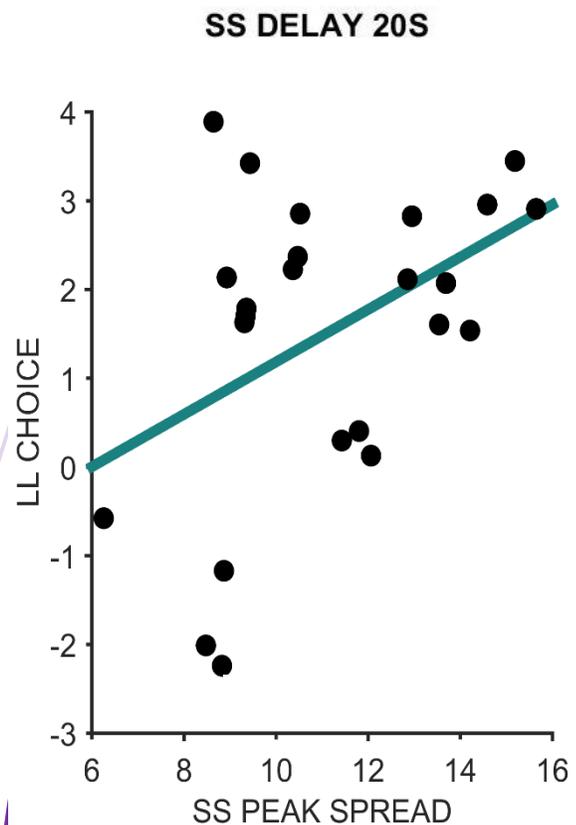


Marshall, Smith, Kirkpatrick, 2014.



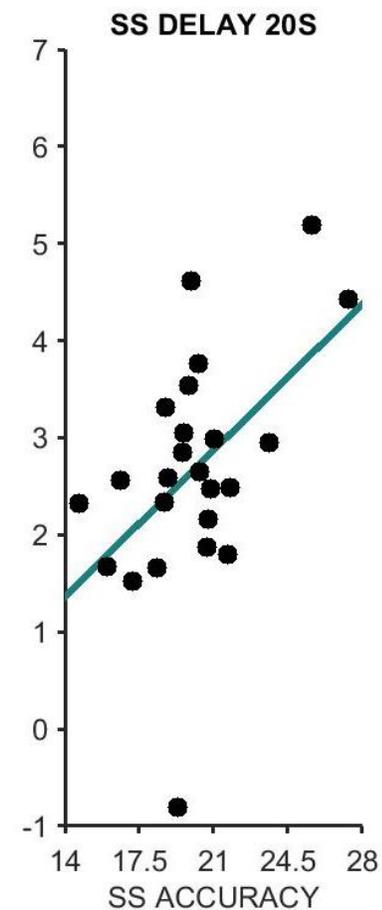
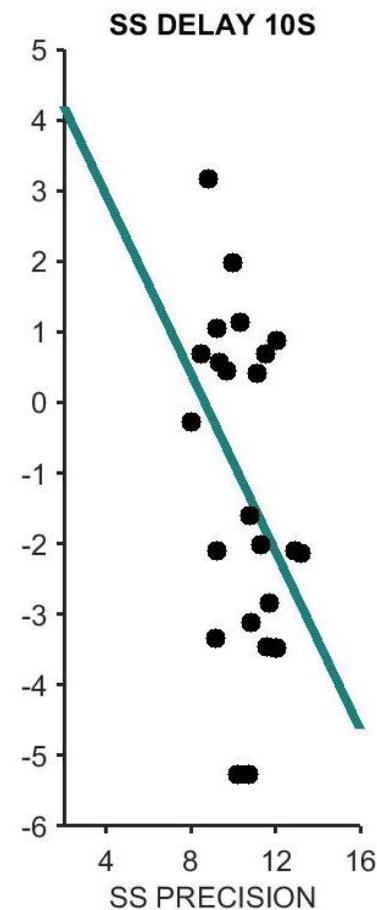
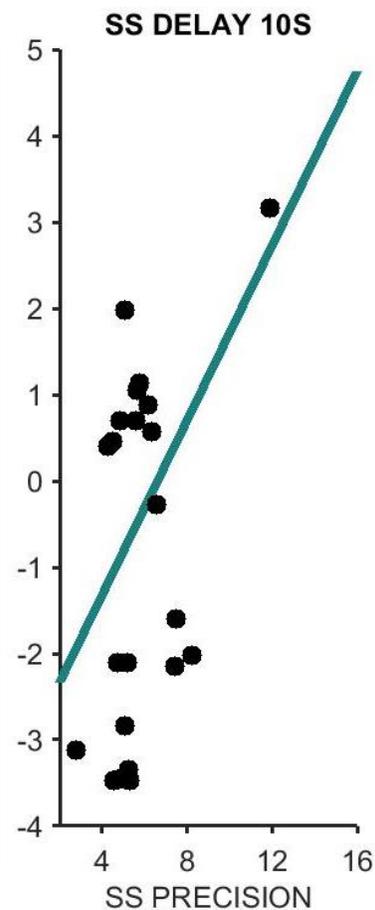
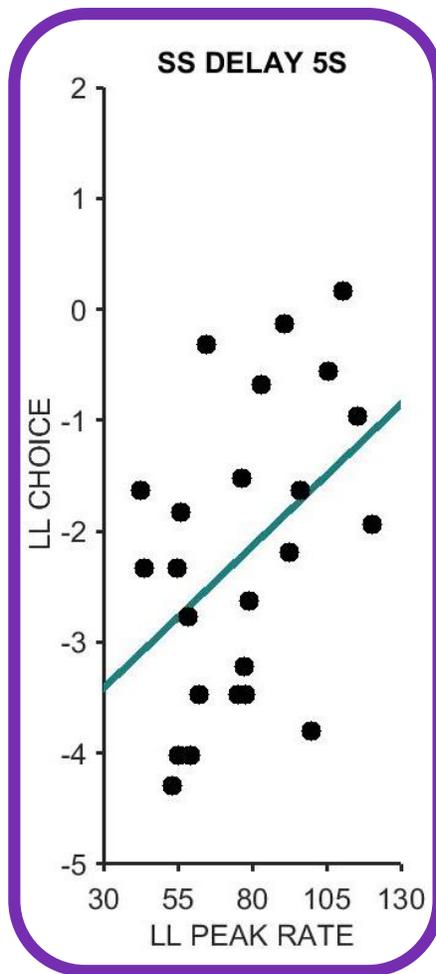


Males



Smith, Marshall, Kirkpatrick, 2015.

Females

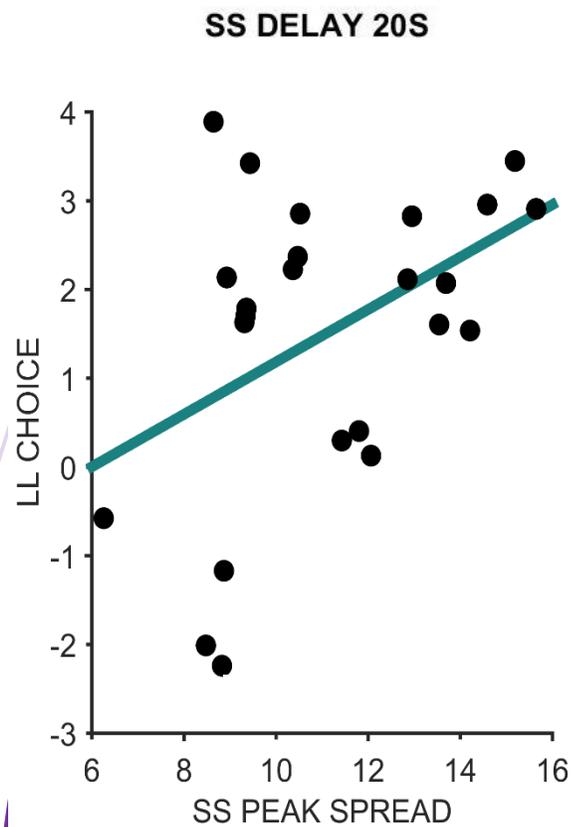


Stuebing, Marshall, Kirkpatrick, In Prep.



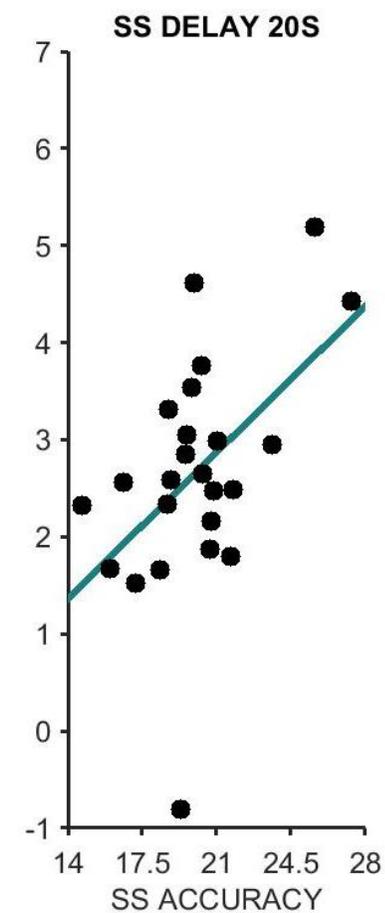
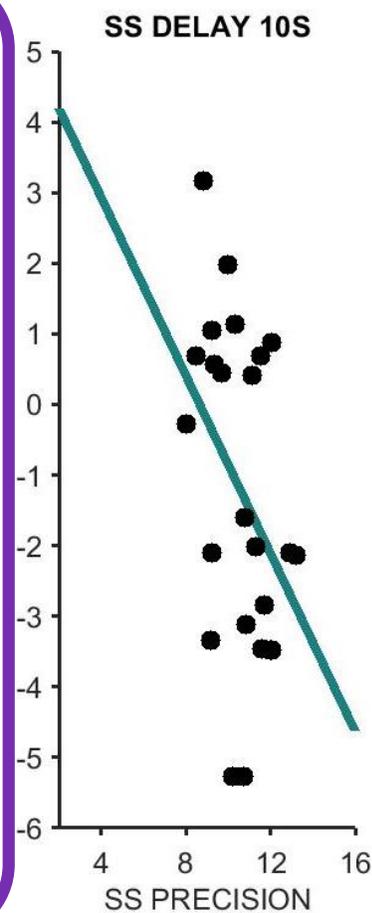
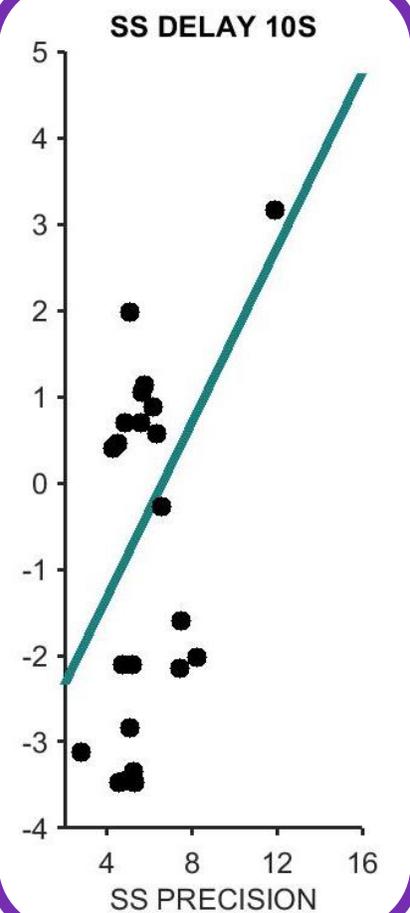
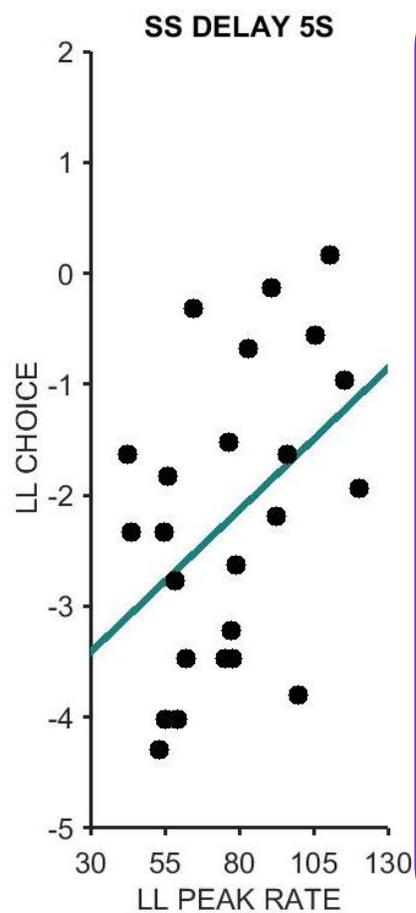


Males



Smith, Marshall, Kirkpatrick, 2015.

Females

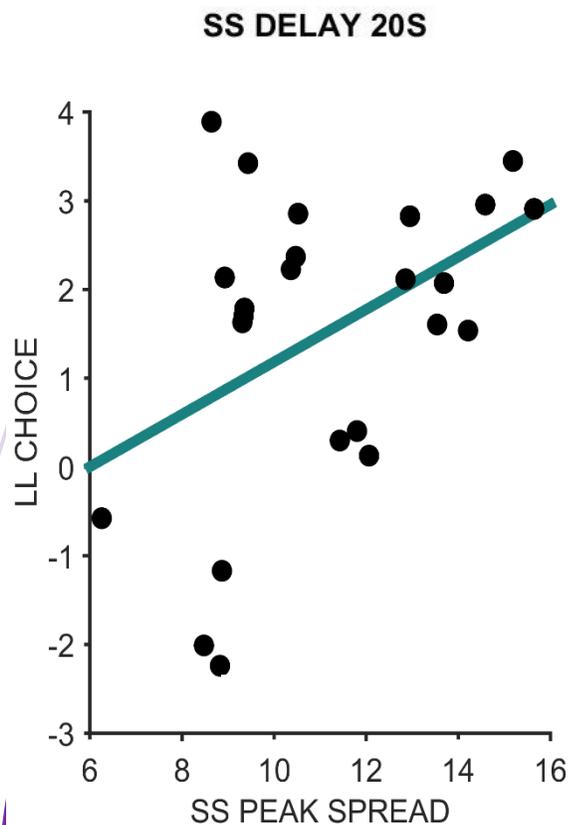


Stuebing, Marshall, Kirkpatrick, In Prep.



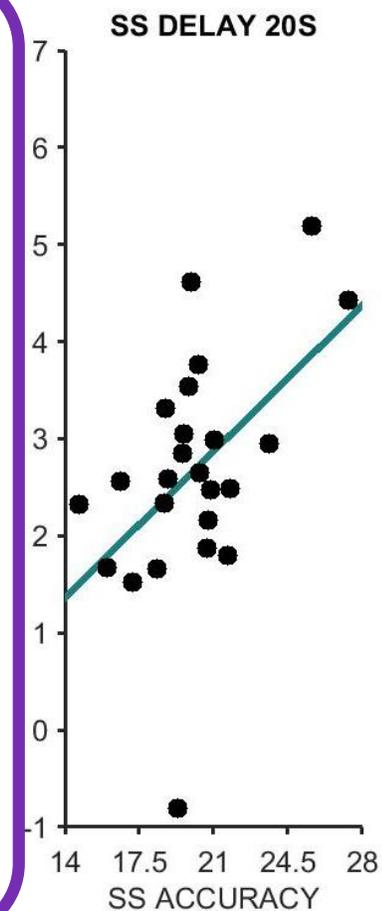
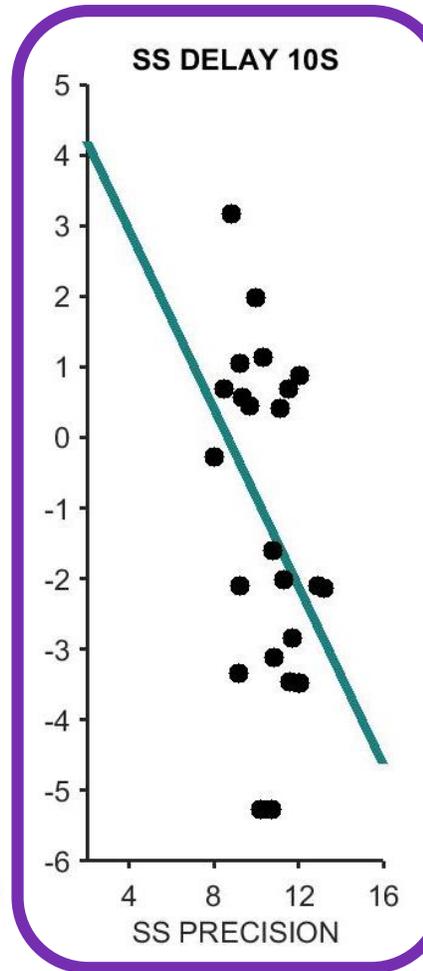
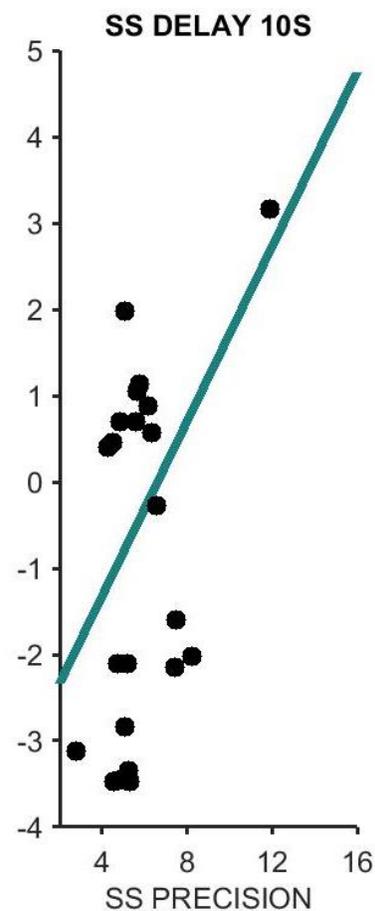
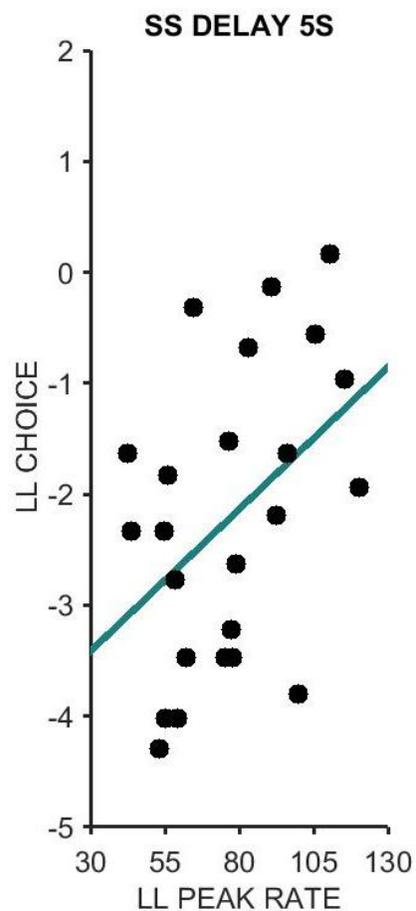


Males



Smith, Marshall, Kirkpatrick, 2015.

Females

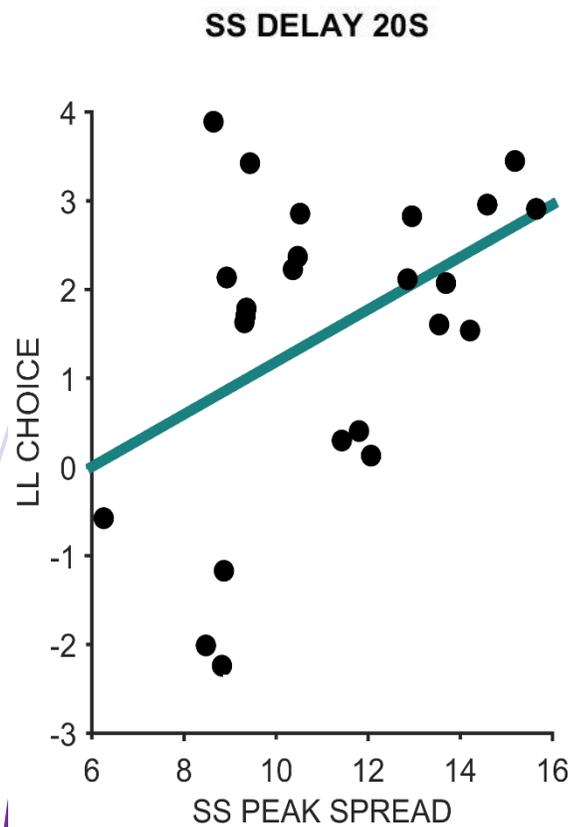


Stuebing, Marshall, Kirkpatrick, In Prep.



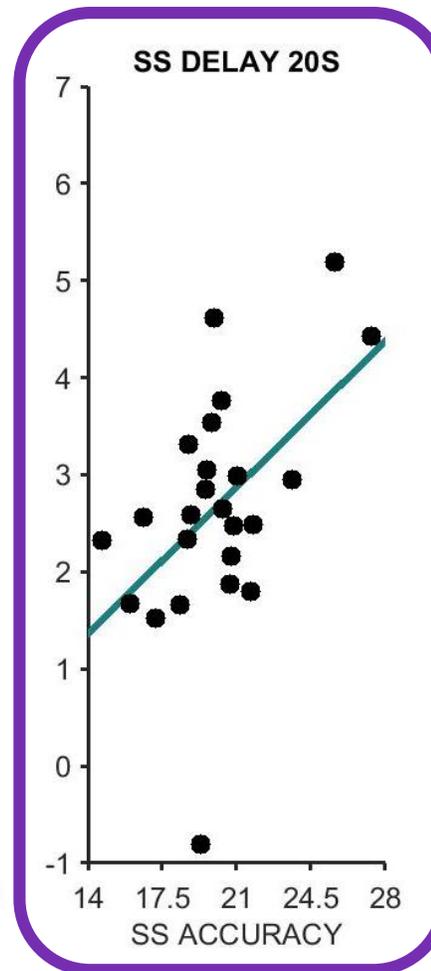
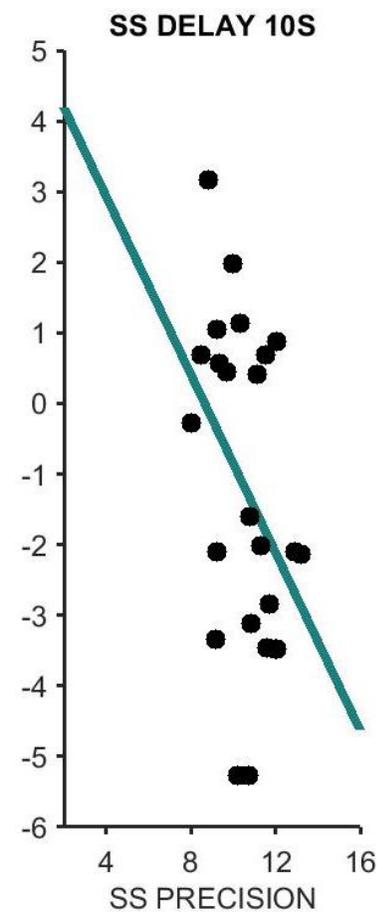
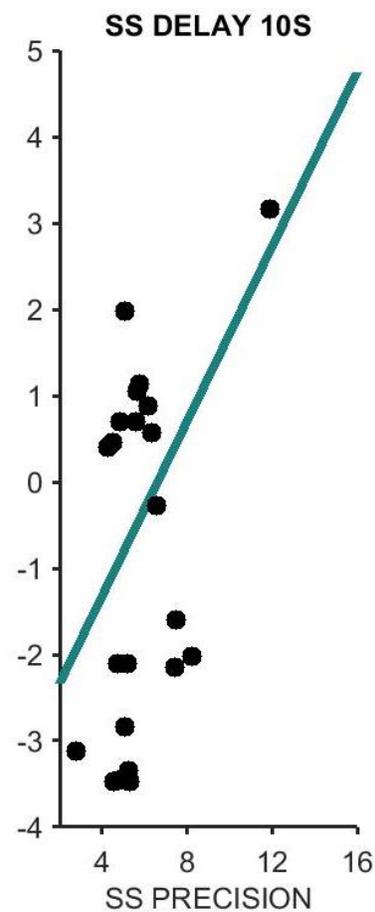
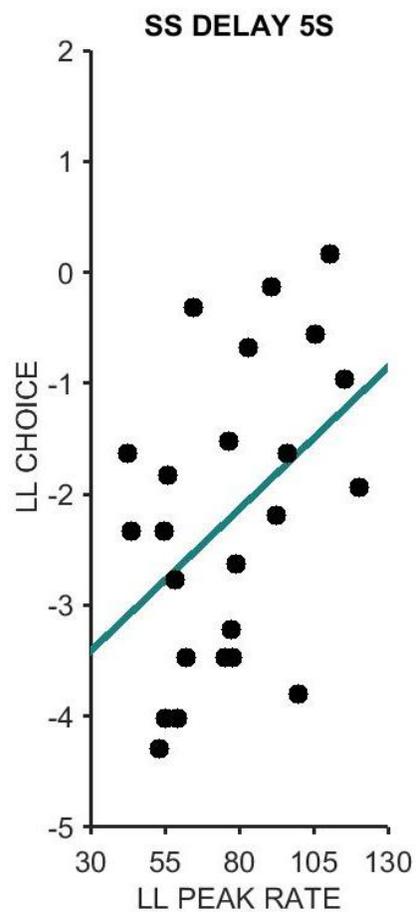


Males



Smith, Marshall, Kirkpatrick, 2015.

Females



Stuebing, Marshall, Kirkpatrick, In Prep.





Conclusions

- ▶ Female and male rats are similar in choice and timing behavior
 - ▶ However, there may be underlying differences
- ▶ Potential explanations include:
 - ▶ exploration vs exploitation behavior
 - ▶ local vs global rate of reinforcement
 - ▶ sensitivity to reward
 - ▶ neurobiological and biological differences





Further Directions

- ▶ Temporal interventions in female rats
 - ▶ See Poster 532.10/Z43 on Tuesday morning
- ▶ Continued analysis
 - ▶ Explorative behavior
 - ▶ Weight impact
- ▶ Direct female to male comparison





Acknowledgments



Andrew Marshall



Dr. Kimberly Kirkpatrick

- Reward, Timing and Decision Laboratory members
- This work was funded by RO1-MH085739

