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1 Introduction

- Male and female mice show differential responses in social behavior tasks.¹
- Striatal dopamine (DA) has a role in socially motivated behaviors like mating and maternal care.²
- Reduced DA activity was associated with low social motivation.³
- Socially isolated mice treated with DA reuptake inhibitor expressed increased social play.⁴
- A standardized way to measure social motivation does not yet exist. The current study uses the barrier task⁵ to measure social motivation and serves as proof of concept for its use in mice.
- The current study aimed to investigate the effects of DA receptor activation and antagonism on social motivation in male and female mice as measured by the barrier task.

2 Methods

- Eight- to ten-week-old C57BL/6J male and female mice were dosed with i.p. injections of either saline (.2ml), levodopa (1mg/kg)/benserazide (1mg/kg), or DA antagonist (raclopride 0.05mg/kg and SCH 23390 0.1mg/kg) prior to behavioral task.
- The experimental mouse was placed on opposing side of same sex stimulus mouse and given three minutes to cross each of three barriers which incrementally increased in height.
- Two minutes for social exploration was allowed.

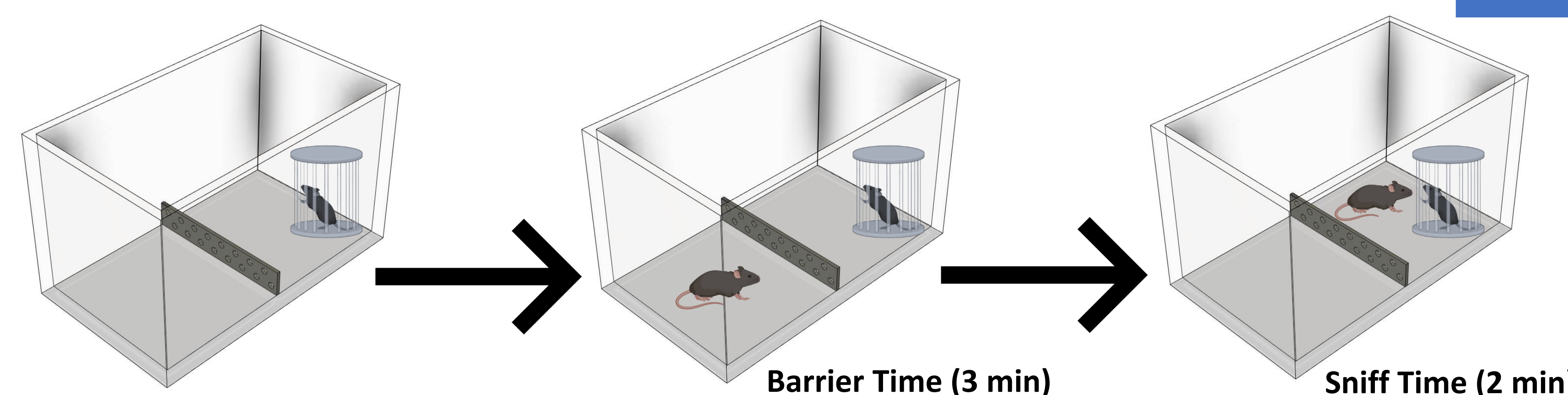


Figure 1. Social Motivation Task: Depiction of behavioral task and arena

Group	Drug	Sex	Test	N
1	Saline	Male	Social Motivation	10
2	Saline	Female	Social Motivation	10
3	Levodopa	Male	Social Motivation	10
4	Levodopa	Female	Social Motivation	10
5	DA antagonist	Male	Social Motivation	10
6	DA antagonist	Female	Social Motivation	10

Table 1. Experimental Groups

3 Results

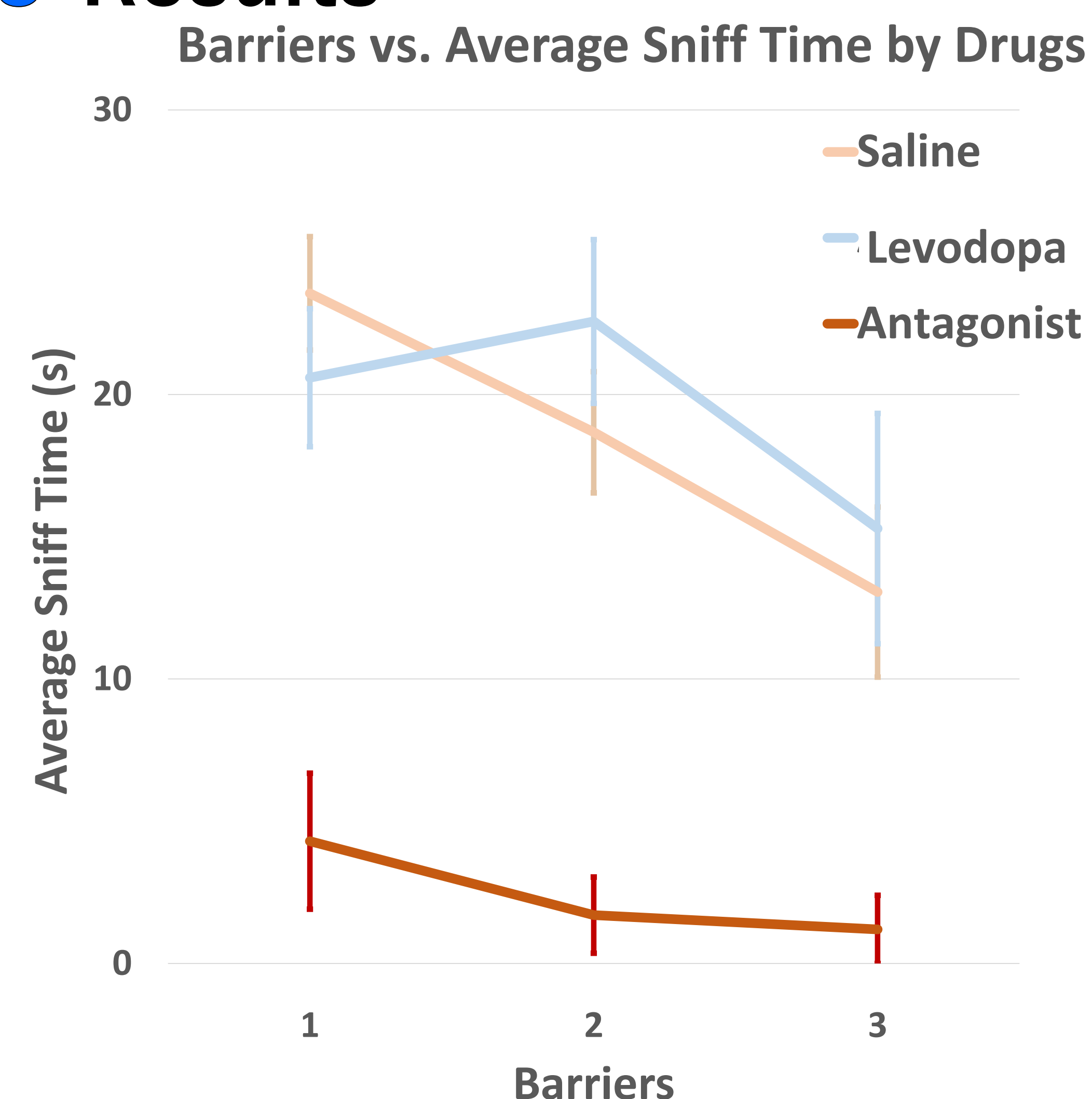


Figure 2. Sniff Time

Time spent sniffing social stimulus after each barrier. Male and female data combined.

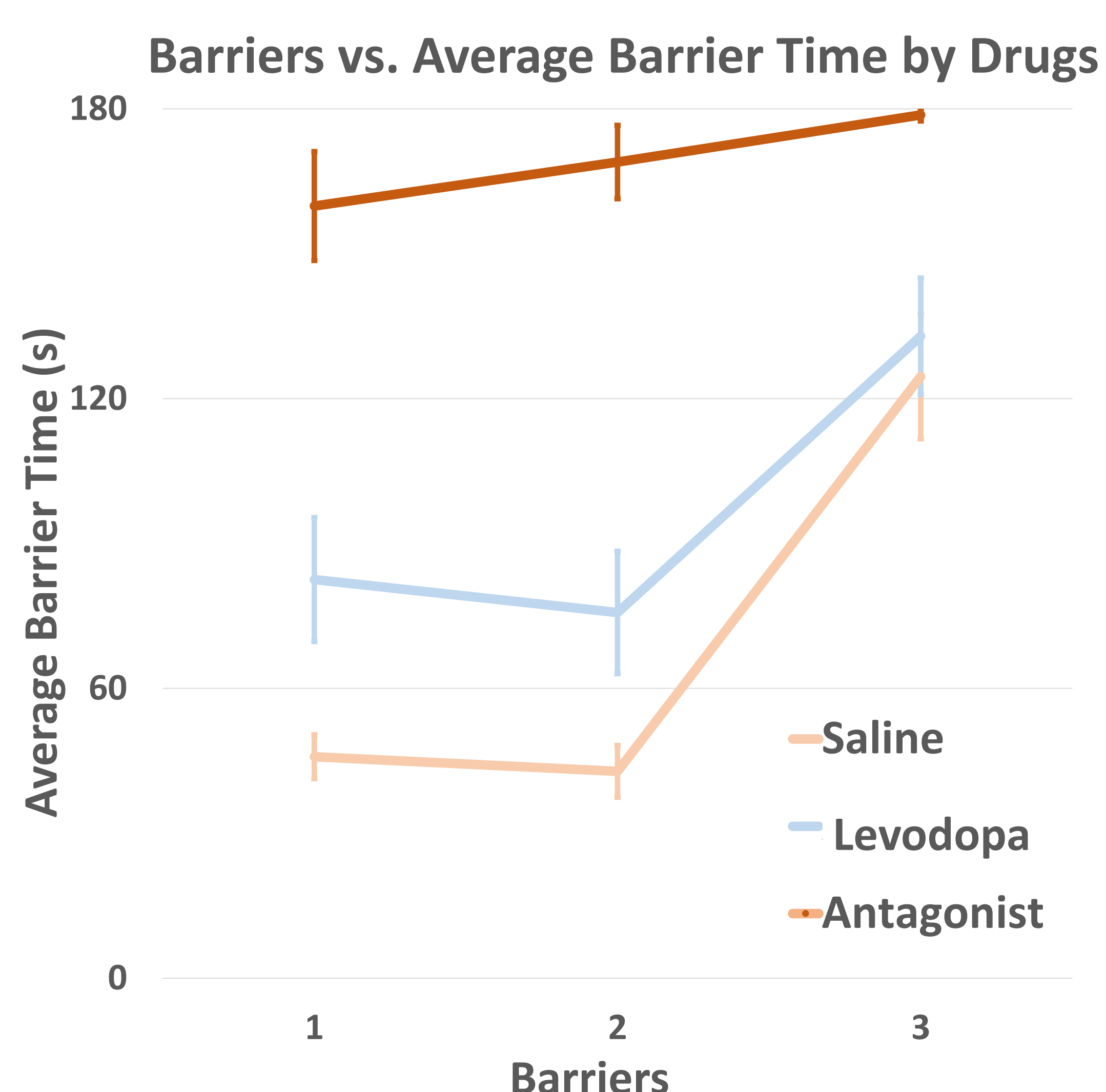


Figure 3. Barrier Time

Time spent crossing each barrier. Male and female data combined.

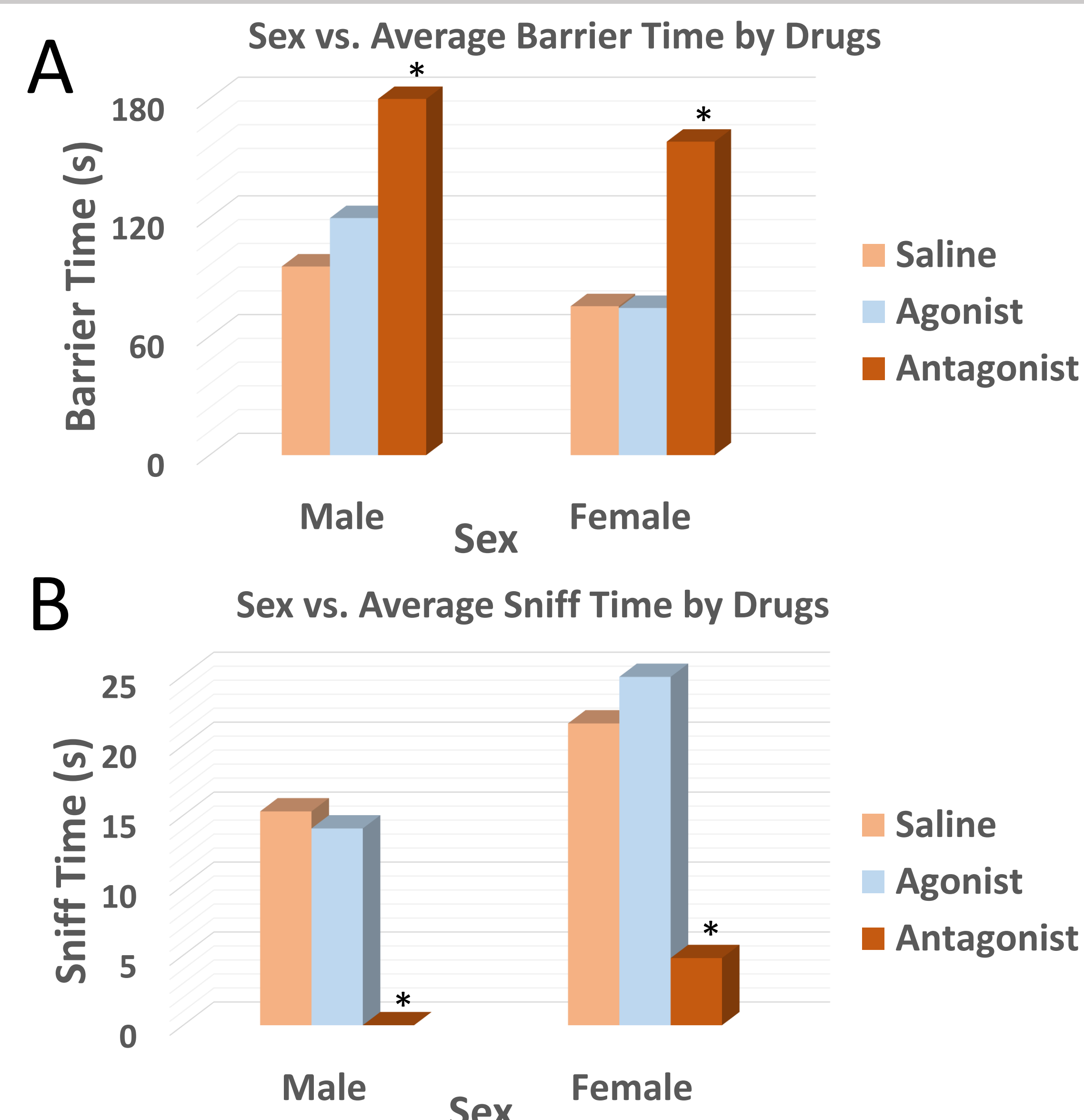


Figure 4. Sex Differences

Comparisons of time spent crossing barriers (A) and time spent sniffing (B) across sex and drug.

4 Conclusions

- Systemic levodopa administration did not significantly increase preference for social motivation in both male and female adult mice as measured by barrier time when compared to saline.
- Systemic DA antagonist administration significantly increased barrier crossing and decreased sniff time in both male and female adult mice measured by barrier time and sniff time.
- Significant sex differences in barrier crossing time and sniff time and drug*sex interactions in barrier crossing time.

5 References

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3. Rincón-Cortés and Grace. (2020) *Neuropsychopharm.*
4. Achterberg, E., et al. (2016) *Neuropsychopharm.*
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