

Introduction

- Environmental enrichment effects on response to rewarding stimuli and in rule learning lead to the inference that differential rearing may have influence on rats' impulsive and risky choice behavior, as well as, behavioral flexibility.^{1,2}
- Social cohorts and novel objects have been compounded together to produce enrichment in previous studies.¹ However, whether social and novelty factors separately influence enrichment results has not been examined.
- The current study sought to parse out the social and novelty enrichment effects on impulsive and risky choice behavior, and behavioral flexibility.

Method

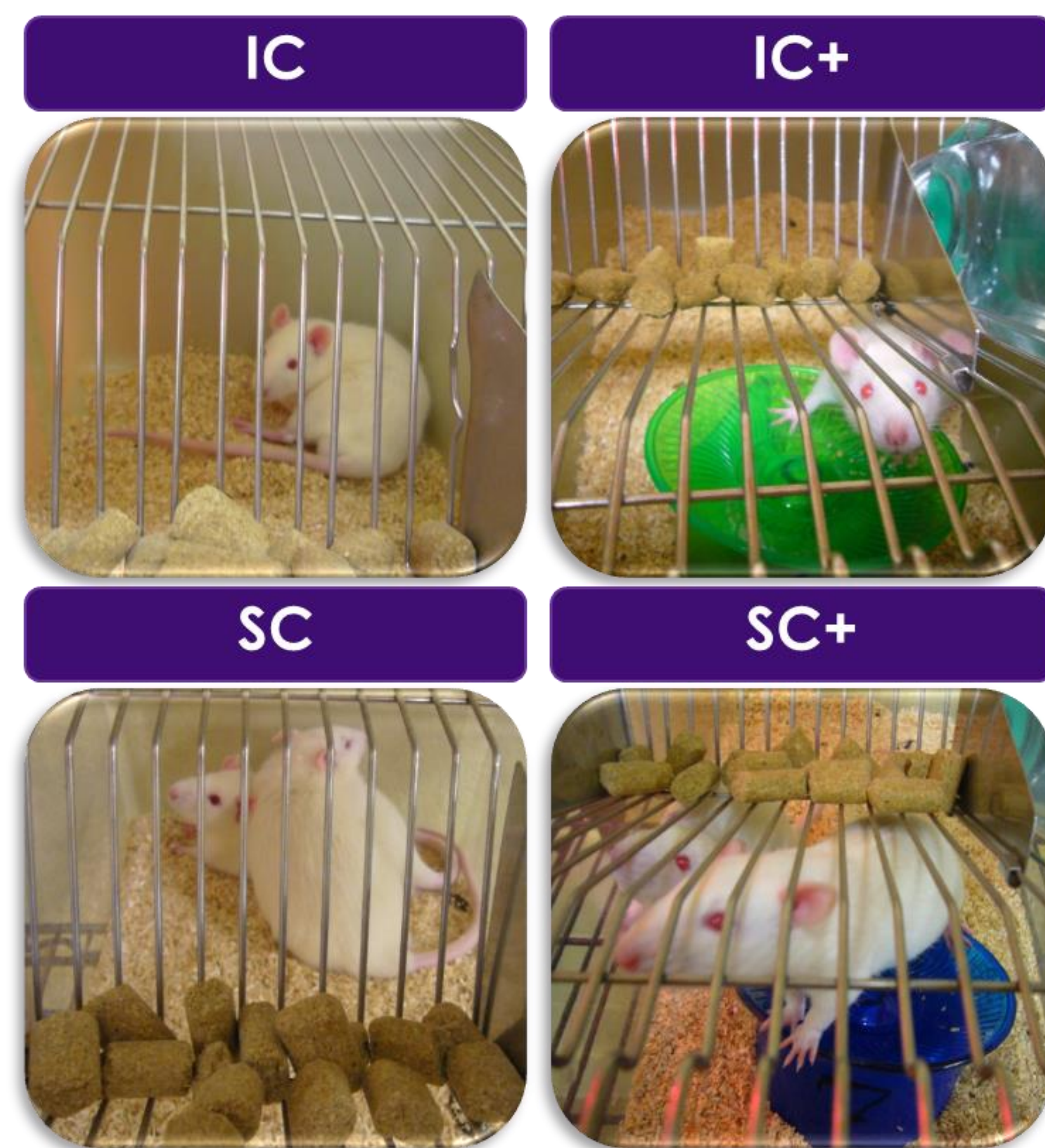


Figure 1. Enrichment Paradigm

24 male Sprague-Dawley rats
Rearing for 30 days (PND 21 to 51)

- IC: Isolated condition
- IC+: Isolated condition + novelty
- SC: Social condition.
- SC+: Social condition + novelty

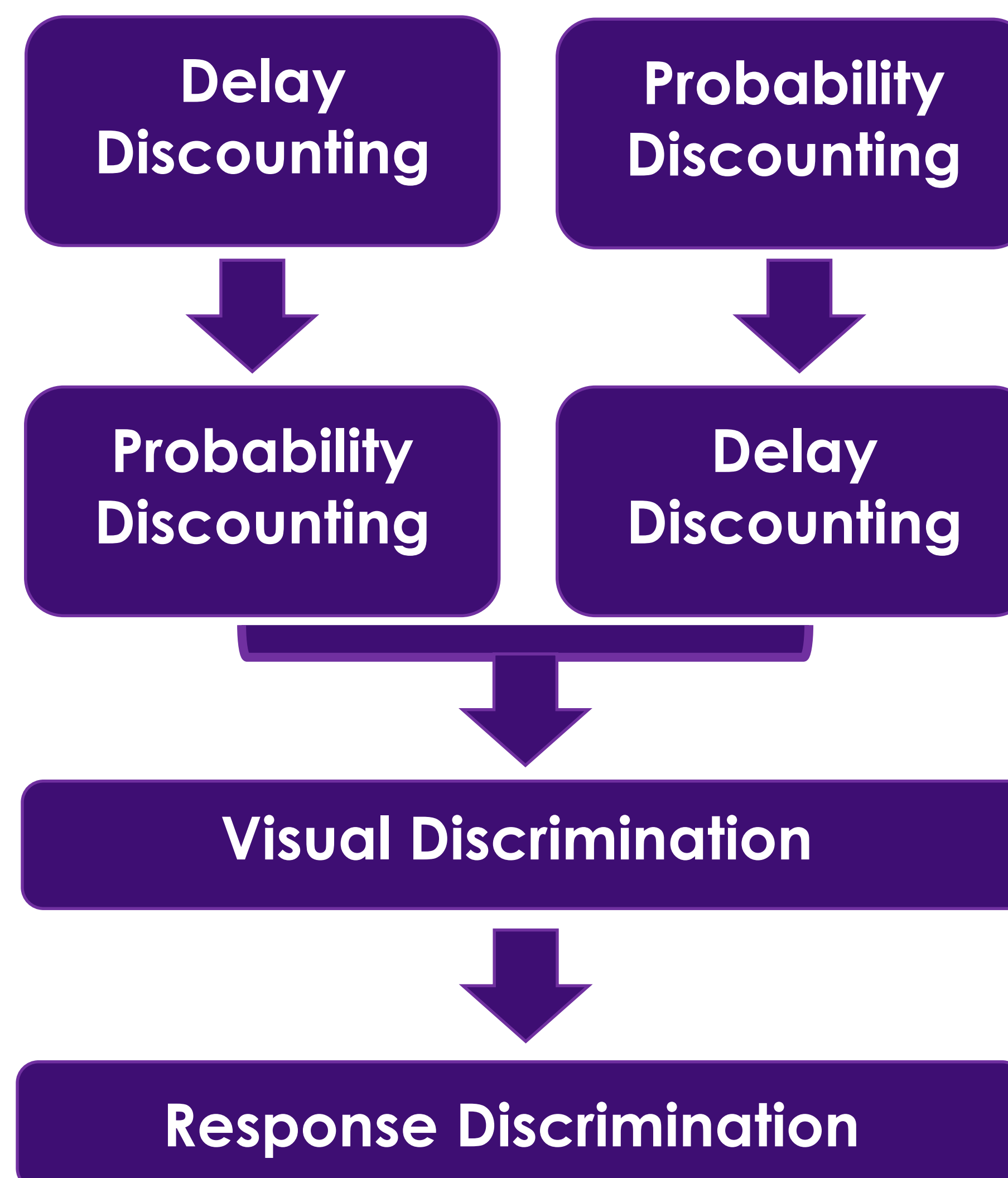


Figure 2. Testing Procedure

Smaller reward = 1 pellet
Larger reward = 2 pellets

Delay discounting³:

7.5 → 15 → 30 → 60 s

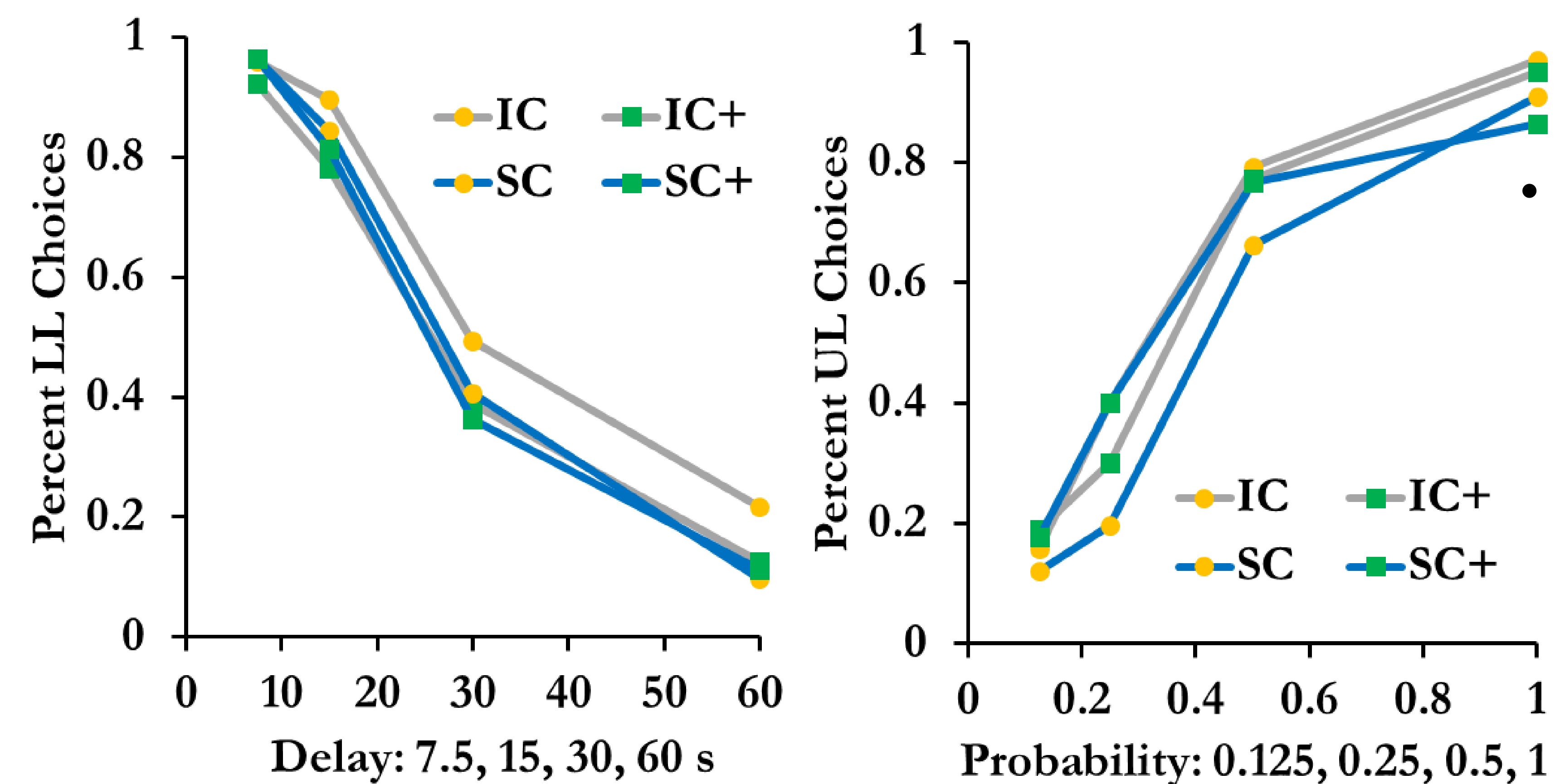
Probability discounting⁴:

1 → .5 → .25 → .125

Behavioral Flexibility⁵: visual discrimination to response discrimination set-switching task

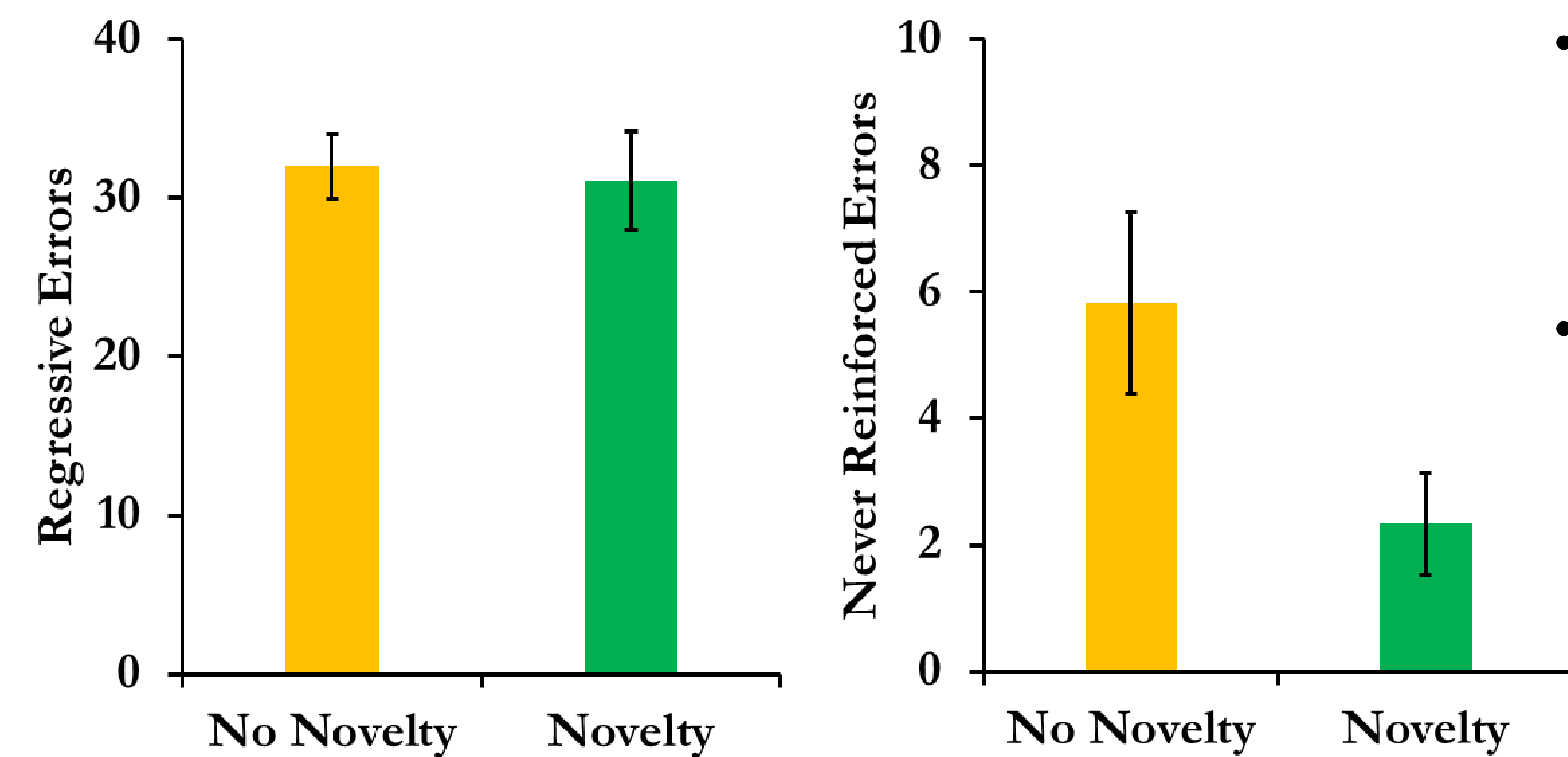
Results

Figures 3 and 4. Impulsive and Risky Choice Behavior



- Enrichment effect was not significant, but there was a transient effect during acquisition (not shown)

Figures 5 and 6. Behavioral Flexibility Task Errors



- Number of regressive errors was not significantly different across rearing groups
- Novelty enriched rats (IC+ and SC+) made significantly fewer never reinforced errors, which indicates less lever sampling

Discussion

- Social and novelty enrichment did not affect impulsive or risky choice behaviors.
- Novelty enrichment showed a selective effect on behavioral flexibility by decreasing never reinforced errors, indicating a potential effect of novelty enrichment on rats' novelty-seeking behaviors.

References

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2. Simpson, J., & Kelly, J. P. (2011). The impact of environmental enrichment in laboratory rats—behavioural and neurochemical aspects. *Behavioural Brain Research*, 222(1), 246-264.
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4. Evenden, J. L., & Ryan, C. N. (1996). The pharmacology of impulsive behaviour in rats: the effects of drugs on response choice with varying delays of reinforcement. *Psychopharmacology*, 128(2), 161-170.
5. Floresco, S. B., Block, A. E., & Tse, M. T. (2008). Inactivation of the medial prefrontal cortex of the rat impairs strategy set-shifting, but not reversal learning, using a novel, automated procedure. *Behavioural Brain Research*, 190(1), 85-96.