Environmental Rearing Effects on Behavioral Flexibility
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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
Reared 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 select 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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