

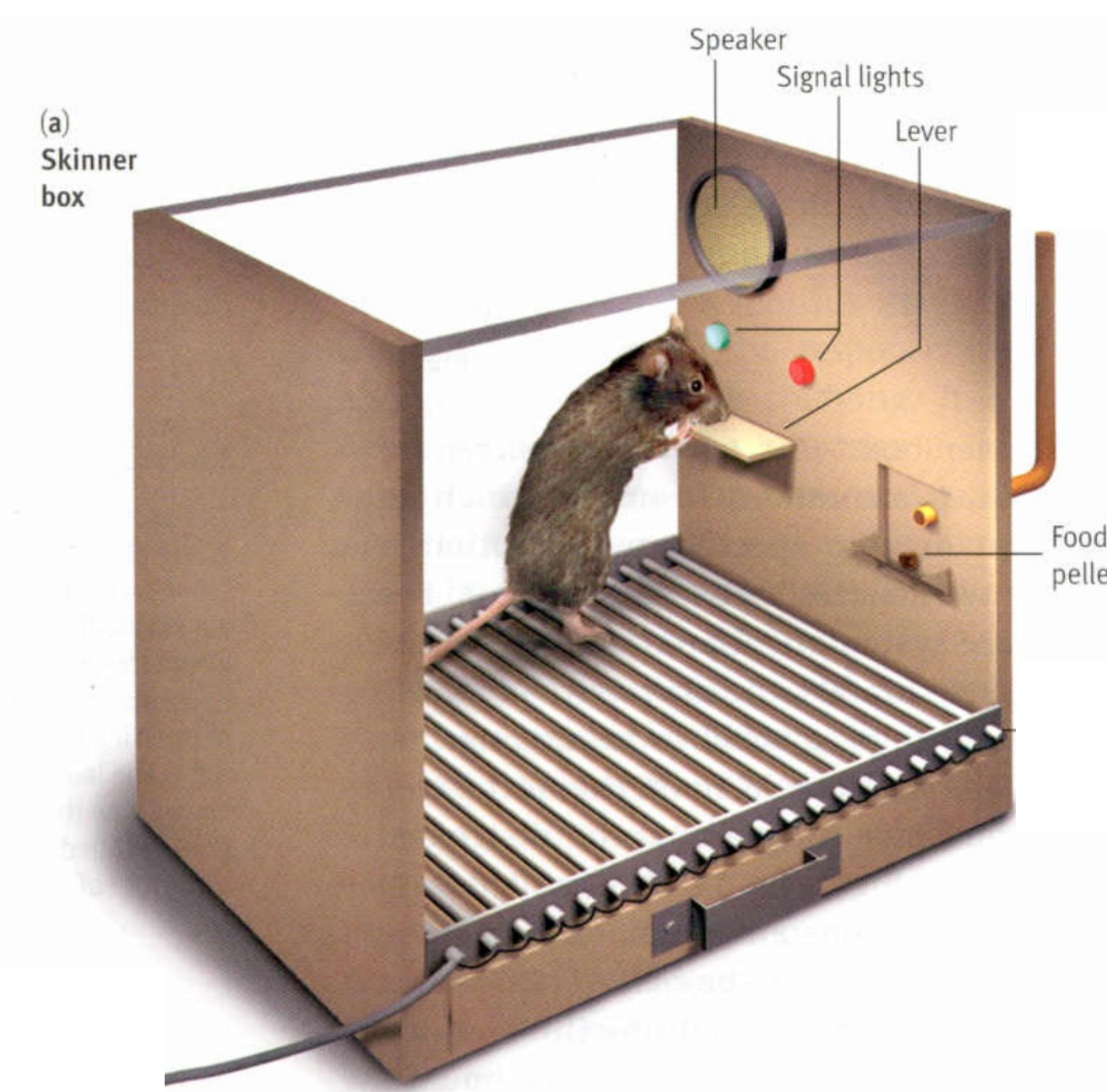
Comparing Rats' Intrinsic Motivation to Lever Press in the Presence or Absence of Extrinsic Rewards



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Introduction

- Motivation can be extrinsic, such as being driven by rewards, or intrinsic, where the drive is to engage in the behavior simply for the act itself.
- Intrinsic motivation is predictive of performance in school, work, and in the engagement and persistence of learning (Ryan & Deci, 2000).
- Harlow, Harlow, and Meyer (1950) found that rhesus monkeys solved a six-part puzzle in the absence of any extrinsic rewards. When some monkeys were given food placed on top of the puzzle, this disrupted puzzle performance.
- The overjustification hypothesis states that if an intrinsically motivated behavior is followed by the delivery of an extrinsic reward, the intrinsic motivation to engage in that same behavior is reduced.
- Lepper et al. (1973) found that children that received a certificate for drawing, subsequently spent less time drawing (i.e., were less intrinsically motivated to draw) than children that received an unexpected reward, or no reward.
- Alternatively, some research has found that intrinsic motivation can increase after expected reward of a low-interest behavior (Cameron et al., 2001)
- Research (Goodrick, 1970) has found that rats will reliably press a lever if presses are followed by the illumination of a light (i.e., stimulus change, like color showing up on paper after drawing).
- The current study investigated if the overjustification effect would occur in rats when using lever pressing as a measure of intrinsic motivation.



Method

- *Subjects.* 24 Long-Evans hooded rats.
- *IV.* Reward between groups [Extrinsic Reward (ER), Unexpected Reward (UR), or No Reward (NR)]
- *DV.* Mean number of lever presses (LPs)
- *Hypothesis.* Based on the overjustification effect, it was expected that Group UR and Group NR would press at a higher rate than Group ER during Phase 3.

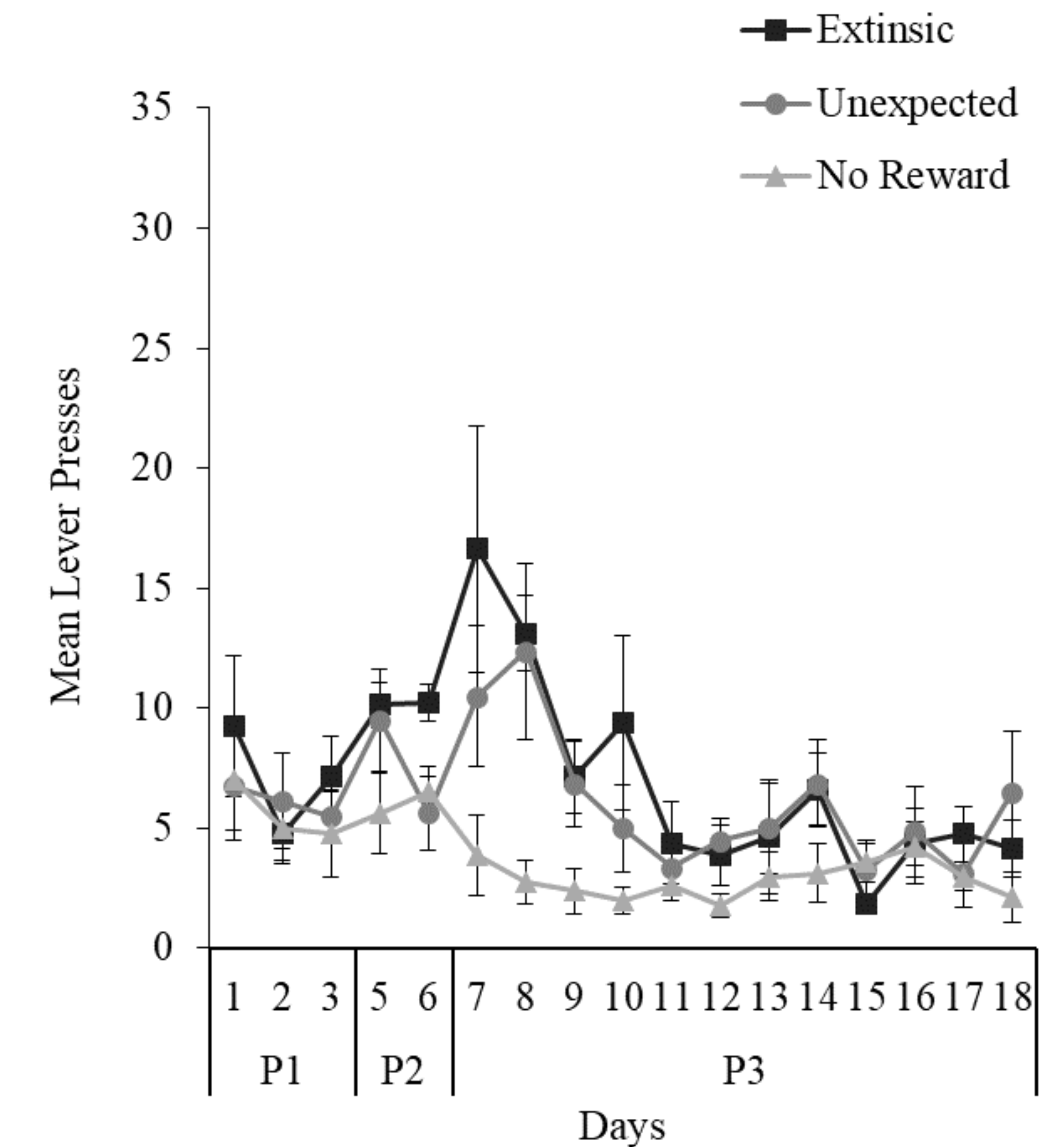
Group	Phase 1	Phase 2	Phase 3
Extrinsic (n = 8)	20-min LP→Light	10-min LP→Light→Food	20-min LP→Light
No Reward (n = 8)		10-min LP→Light	
Unexpected (n = 8)		10-min LP→Light LP→Light→Food	

Results

Phase 1. A repeated measures ANOVA was performed on the number of lever presses with Group (ER, UR, NR) as the between-subjects factor and Session (1-3) as the repeated measures. Analyses revealed no main effects or interactions, $ps \geq .17$.

Phase 2. An ANOVA was performed on the number of lever presses with Group (ER, UR, NR) as a between-subjects factor and Session (5-6) as the repeated measure. There was a main effect of Group, $F(2, 21) = 3.84, p = .04$. Tukey's HSD Post-Hocs were performed on the main effect of Group and revealed that Group NR had significantly less lever presses compared to Group ER, $p = .03$, but Group UR was not different from Groups ER or NR, $ps \geq .59$.

Phase 3. An ANOVA was performed on the number of lever presses during the second half of Phase 3 with Group (ER, UR, NR) as the between-subjects factor and Session (13-18) as the repeated measure. There was no main effect of Group, $F(2, 21) = 1.14, p = .34$, of Session, $F(5, 105) = 1.33, p = .26$, and the Group by Session interaction was nonsignificant, $F(10, 105) = .85, p = .58$.



Discussion

- The overjustification effect was not observed in this study; rather, all groups pressed similarly in Phase 3.
- In future experiments, we will compare whether reinserting the lever within a session (i.e., 5-min lever, 5-min no lever, 5-min lever) results in a higher rate of lever pressing compared to the lever being inserted into the chamber once per session (i.e., 5-min no lever, 10-min lever, 5-min no lever).

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