

Assessing Cross-Price Interactions Between Social and Food Reinforcement

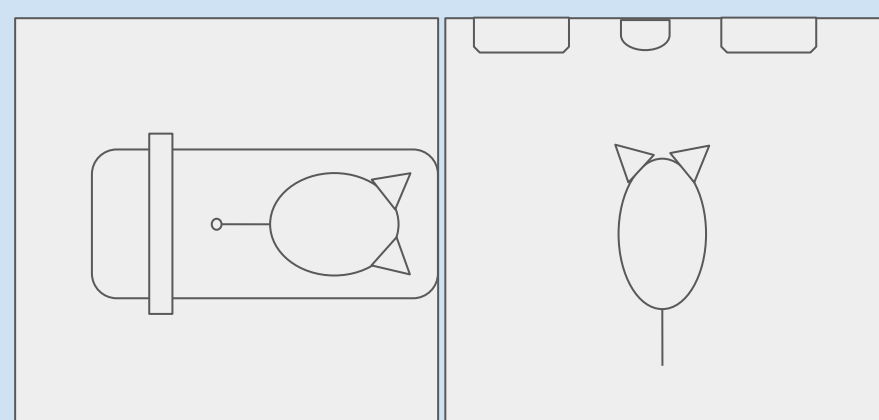
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Background

- Previous research has shown that rats will work to release a partner rat from a restraint, suggesting an important role for social reinforcement (Hiura et al., 2018).
- All else equal, rats tend to prefer food to social reinforcers, but little is known about the economic relationships between these two reinforcers.
- The present study used methods from behavioral economics to assess interactions between food and social reinforcers as the price was systematically altered
- Phase 1: FR food price increased, social price remained constant
- Phase 2: FR social price increased, food price remained constant
- Phase 3: FR food and social price increased together
- Own-price elasticity:** sensitivity of **A** to price changes in **A**
- Cross-price elasticity:** sensitivity of **B** to price changes in **A**

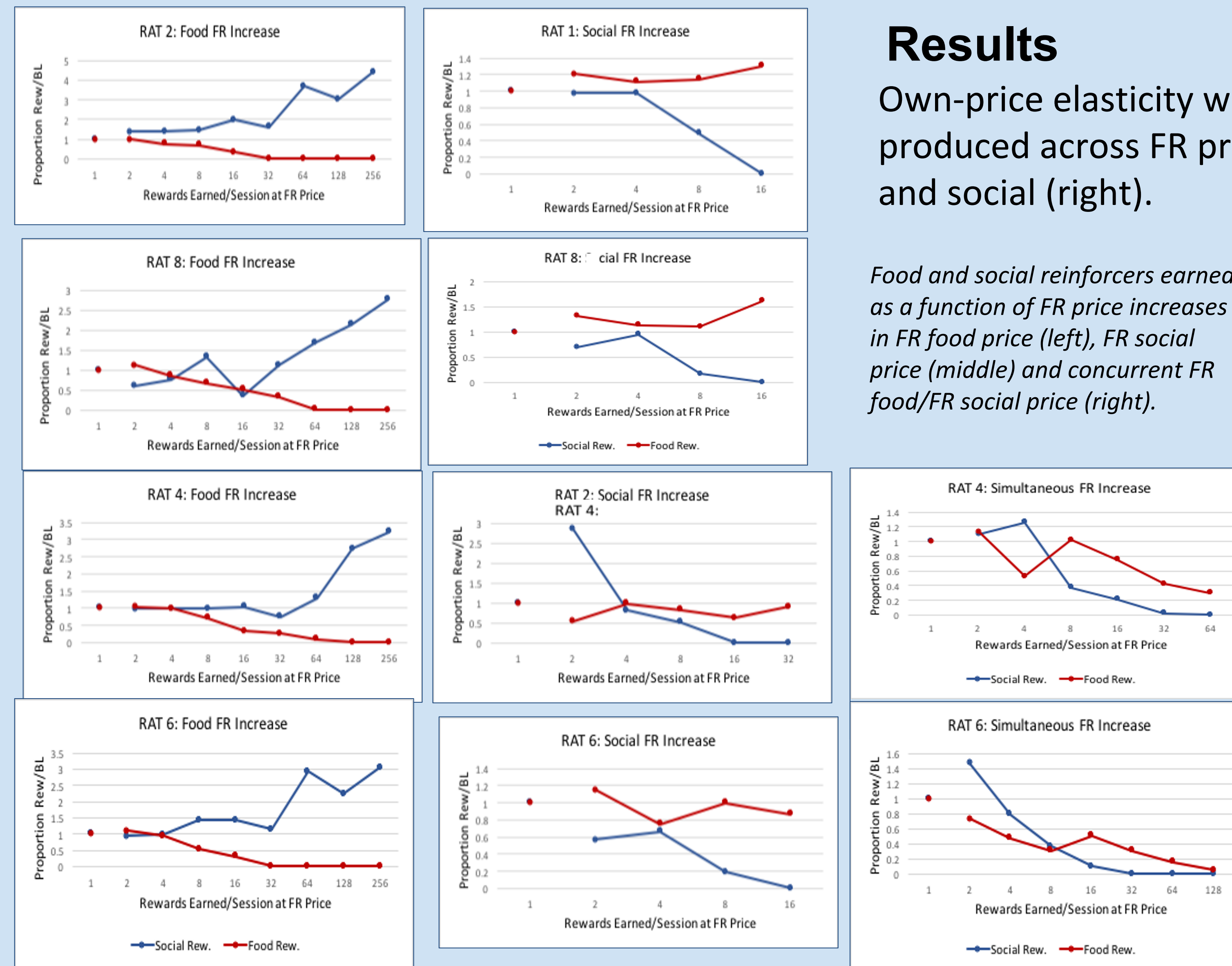
Methods



Responses on the left lever release the restrained rat (left) for 10 s; responses on the right lever produce food.

- Four rats chose between a food pellet and releasing a partner rat for 10 s social interaction
- Concurrent FR1 FR1 schedule as a baseline prior to each of the three conditions:
- 1) **Food price increase:** FR 1-FR x food, FR 1 social
- 2) **Social price increase:** FR 1-FR x social, FR 1 food
- 3) **Concurrent social/food increase:** FR 1 x food, FR x social

x = FR value at which responding fails to earn a reinforcer



Results

Own-price elasticity was seen in the decline in reinforcers produced across FR price: food (left), social (middle), food and social (right).

Food and social reinforcers earned as a function of FR price increases in FR food price (left), FR social price (middle) and concurrent FR food/FR social price (right).

- Social reinforcers more elastic (more sensitive to price changes) than food reinforcers.
- Cross-price elasticity values were positive for social reinforcers (left), suggesting social may be partially substitutable for food reinforcers.
- The values were less positive for food reinforcers (middle), but the demand functions were more condensed; the positive values for social reinforcers were only seen at the higher food prices.

Discussion

- The results provide an important first step in assessing interactions between social and food reinforcers using demand concepts and methods.
- An advantage of such methods is the quantification of different reinforcers, such as food and social contact.
- The results suggest that social and food reinforcers can serve as partial substitutes under some conditions, but because production was limited by the 60-min sessions, changes in price were confounded with income.
- Income-compensated price shift methods would enable more decisive tests of economic relationships.

References

Hiura, L., Tan, L., & Hackenberg, T. D. (2018). To free or not to free: Social reinforcement effects in the social-release paradigm with rats. *Behavioural Processes*, 152, 37-46.

Acknowledgments

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