# *Computerized Money and Food Tasks Use Real Delays and Pseudo-real Rewards to Measure Impulsive Choice*

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## Introduction

- Impulsive behavior is associated with obesity[1], substance abuse[2], and gambling.[3]
- Impulsive choice tasks give the subjects the choice between smaller-sooner (SS) and larger-later (LL) rewards.
- In humans, impulsive choice is often measured by hypothetical tasks, such as the Kirby Questionnaire, which may lack sensitivity to state effects.[4]
- Experiential tasks are used in rodents where the delays and rewards are experienced[5], and these tasks may provide a more comparable measure of impulsivity in humans.

**Study Goals:**

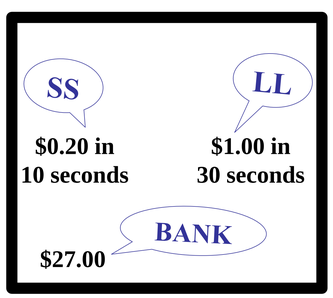
- Create an experiential food choice task
- Compare this task and an experiential money task to the Kirby Questionnaire

## Methods

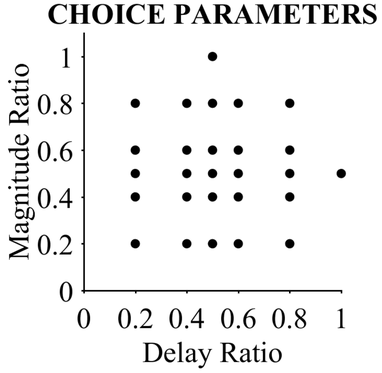
**Participants:** 23 General Psychology students

**Computerized Experiential Tasks:**

- Participants made choices between SS or LL *"pseudo-real"* rewards.
  - *54 money and 32 food (M&Ms or Skittles) choices*
- Participants experienced set delays before banking each reward, but they did not actually receive the reward.
- Choice parameters: Varied the SS and LL reward magnitude and delay. Delay ratio=SS delay/LL delay; Magnitude ratio=SS magnitude/LL magnitude.




PSEUDO-REAL MONEY CHOICE TASK




**Kirby Questionnaire:**

- Participants made 27 choices between a SS or LL hypothetical reward.
- We computed the k-value at which point the participants switched from choosing the SS to the LL.

## Task Comparisons

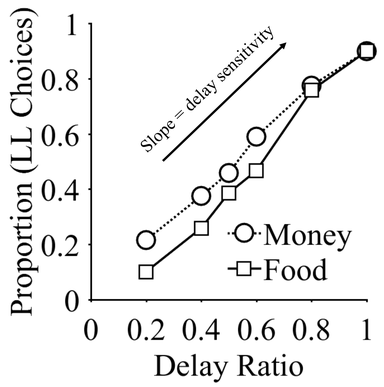



**Figure 1. As delays became similar in duration participants were more likely to choose the LL reward, $p < .01$.**

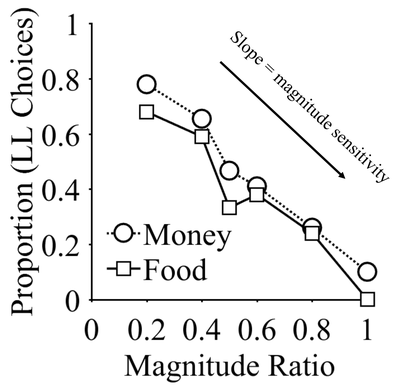
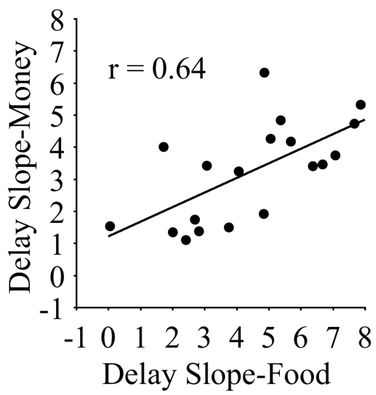
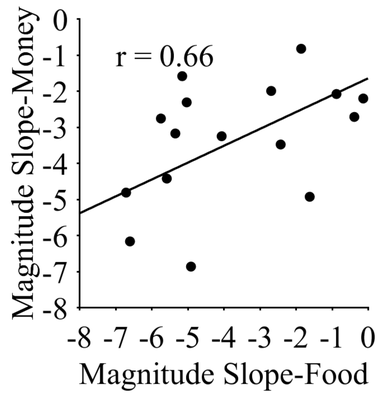


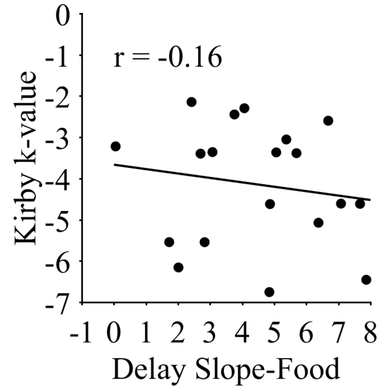

**Figure 2. As rewards became similar in size participants were more likely to choose the SS reward, $p < .01$.**

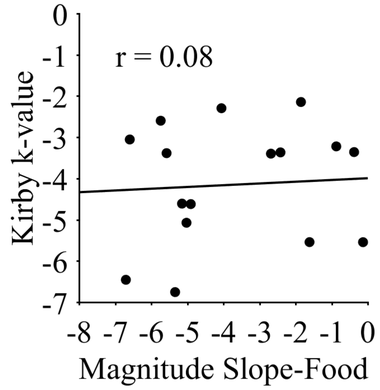


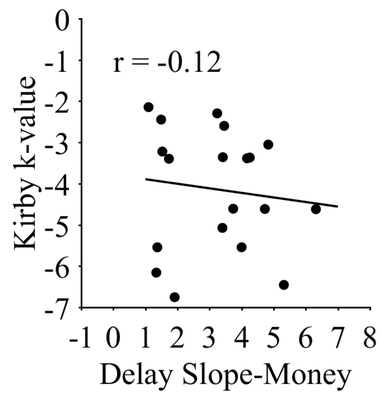

**Figures 3 and 4. Delay and magnitude sensitivity were positively correlated between the money and food tasks, *p*s < .01. This suggests similar choice behavior in the two experiential tasks.**

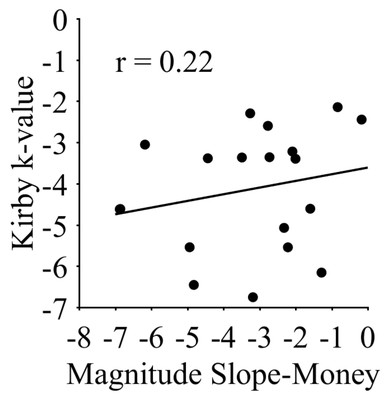
## Kirby Comparisons




**Figures 5 and 6. There was no correlation between k-values and delay or magnitude sensitivity in the food task.**




**Figures 7 and 8. There was no correlation between k-values and delay or magnitude sensitivity in the money task.**

## Discussion

- High positive correlations between delay and magnitude sensitivity suggests that the experiential tasks may measure choice processes.
- Similar to previous findings (Melanko & Larkin, 2013), the experiential tasks were not correlated with the hypothetical delay discounting questionnaire (Kirby).
- The experiential tasks might be more sensitive to state effects, while hypothetical delay discounting questionnaires may be more sensitive to trait effects.
- State effects may pertain to the behavioral responses people make in real situations as opposed to behavioral intentions.
- The experiential tasks may provide a better prediction of choices people make when they actually experience the choice consequences.

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