

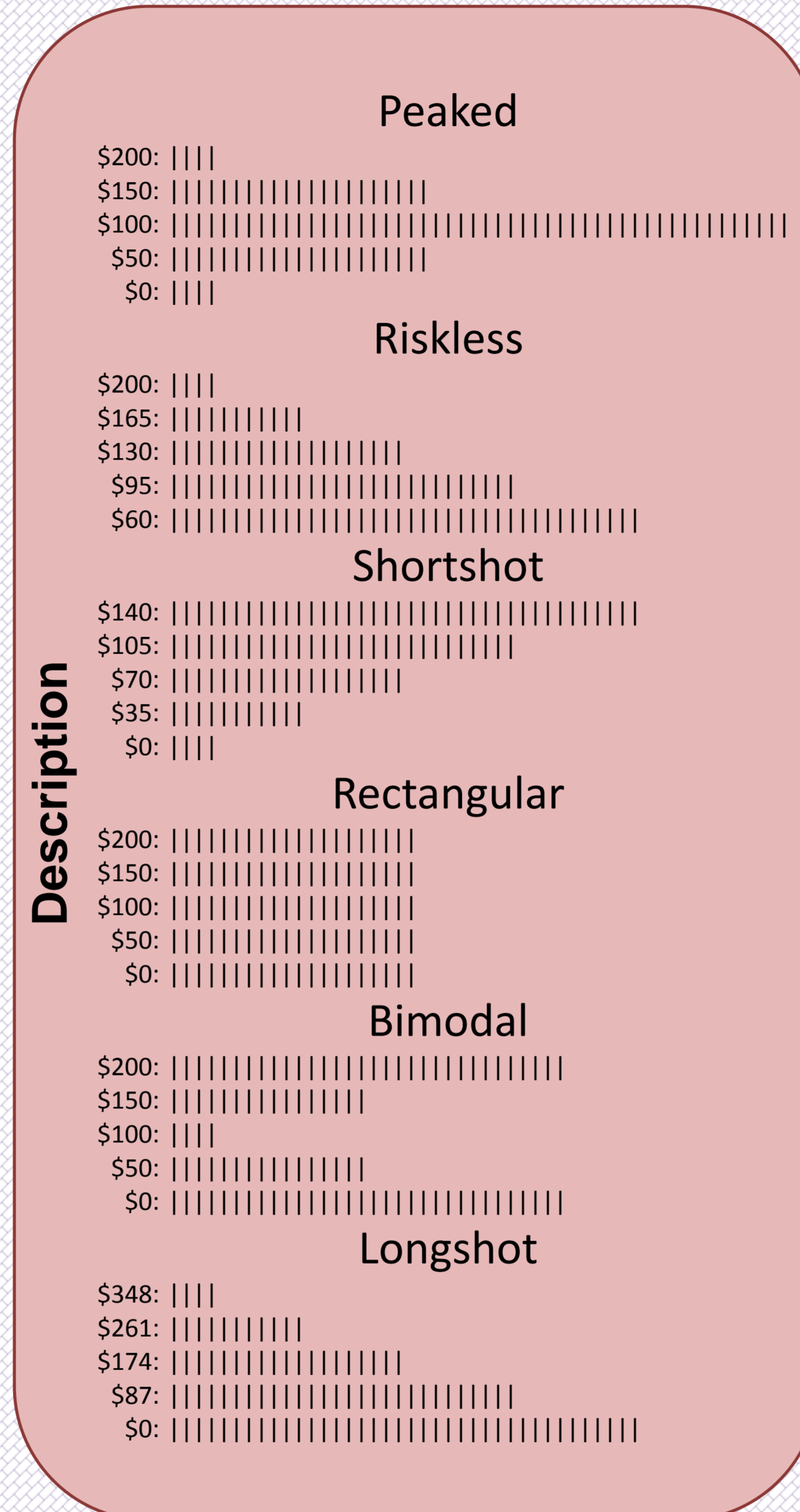
Introduction

Choice relevant information can be learned by two different acquisition formats:

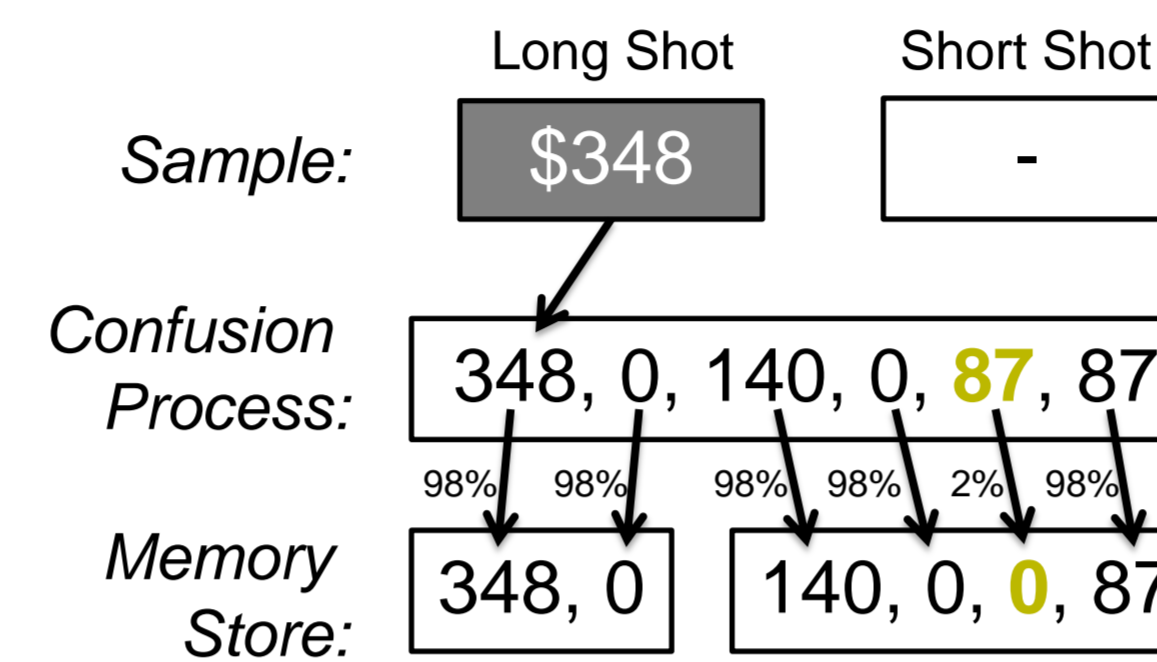
- By **description**, where outcomes and their probabilities are clearly described.
- By **experience**, where outcomes and their probabilities are initially unknown and thus learned through sequential exploration and feedback. There are two paradigms:
 - In the **“Free” paradigm**, samples are for the purpose of exploration followed by a final one-shot choice at any time.
 - In the **“Consequential” paradigm**, each of the 100 samples represents a consequential choice whose outcome adds to a running total.

These two formats of acquisition can lead to different patterns of choice (Rakow & Newell, 2010): the *Description-Experience ‘gap’*.

The present study extended previous work by examining more complex problems, collecting frequency estimates and testing a new model of experience-based choice.



An Exemplar Model of Experience-based Choice

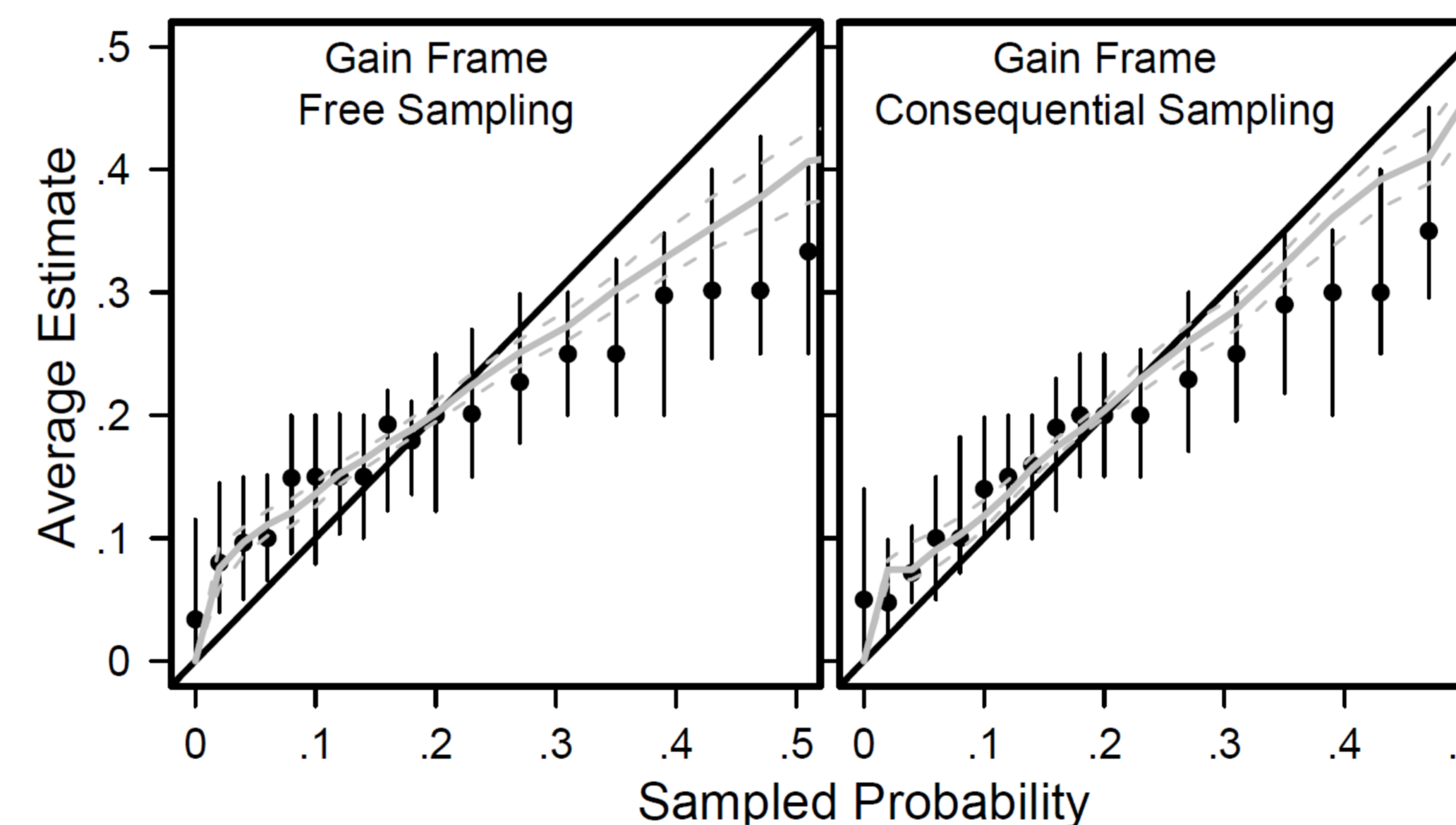


We developed an exemplar model with a “confusion” process: Each time a new outcome is added to the memory store, all memories in the store have a 2% chance of being confused with another stored outcome. There is no limit to the size of the memory store.

After sampling, the preference predicted by the model was determined by whichever set of exemplars had the highest average utility (using the utility function specified by Lopes & Oden (1999): $u(x) = x^{-.551}$).

Predicting Probability Estimates

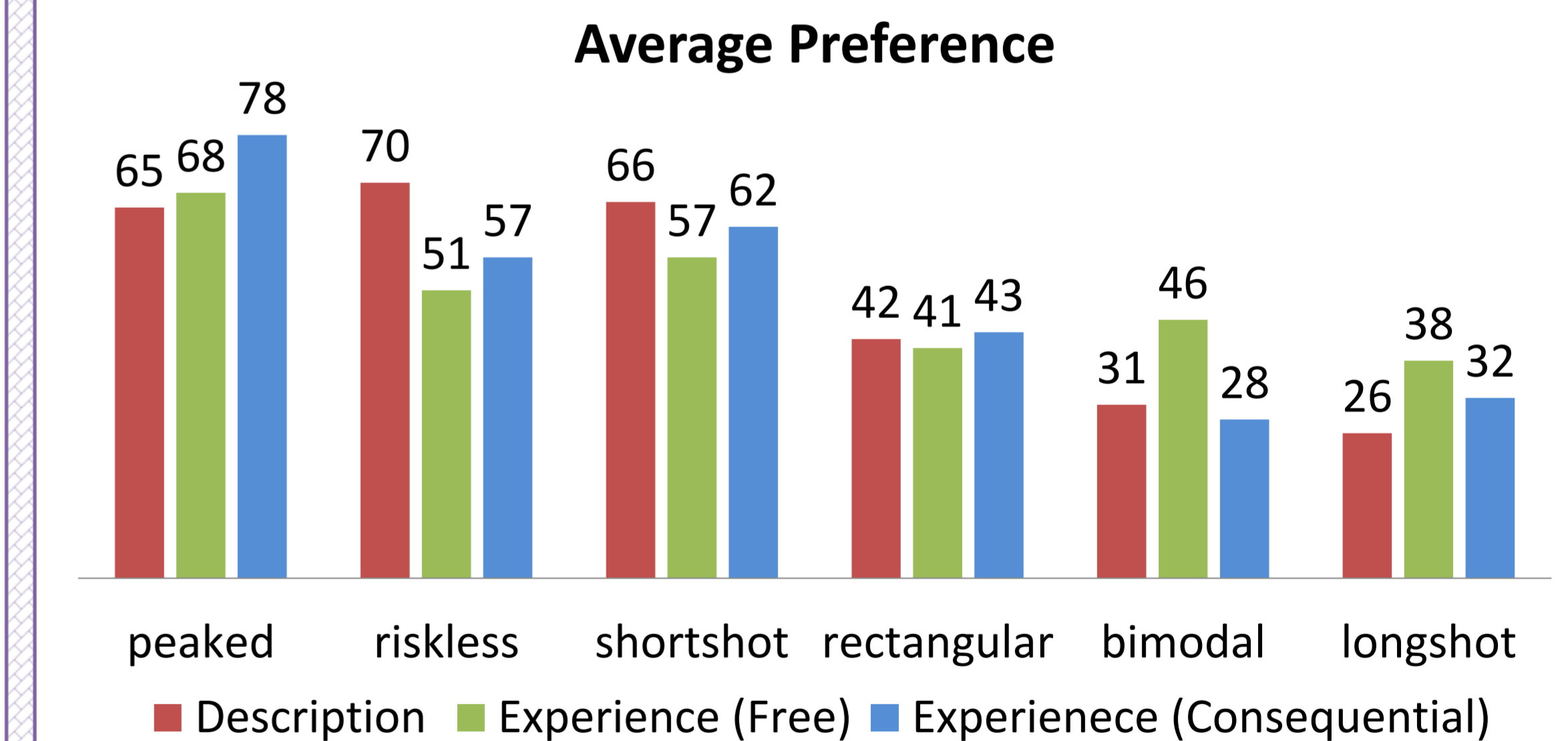
In contrast to other models of experience-based choice, the current model correctly predicts over-estimation of small probabilities and under-estimation of larger probabilities.



Note: Probability estimates from participants (y-axis) against the sampled probability for the corresponding outcome (x-axis). The circles are medians. The whiskers show 5% and 95% quantiles across participants. The thin grey lines show model fits.

Predicting Choice

Averaging across problems, there were mostly similar choice preferences across **Description** and both **Experience** formats. However, differences did occur when there were valuable rare events (e.g., riskless deck), consistent with the hypothesis that rare events are given more weight when described than when experienced (Hertwig & Erev, 2009).



The model predicted 68% of preferences for the **“Free” Experience**, which was 5% better than when based just on the sample information alone. The model predicted 69% of preferences for the **“Consequential” Experience** group, which was 3% better than when based just on the sample information alone.

Methods

Binary choice task:

- Participants faced numerous binary choices between options with equivalent expected values but very different distributions in one of the three choice formats (see choice options developed by Lopes & Oden [1999] above).

Probability estimates:

- In both experience formats, participants were required at the end of the task to estimate the probability of each outcome occurring.

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Conclusions

We found only partial support for a Description-Experience choice gap in the context of a binary choice between alternatives with several outcomes.

The performance of the exemplar model was slightly better than simply comparing at the sample mean of each option, but slightly worse than an augmented version of the *k*-sampler model (69% and 74%, respectively; see Erev et al., 2010). However, our exemplar model adequately captured the frequency estimate trends, which most current models, including the *k*-sampler, fail to do. Thus, the current model may be a potential candidate for understanding experience-based choice.

