Evolution of Reference Points over Time

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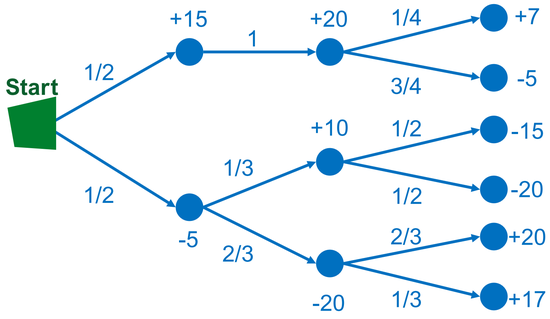
1 Motivation

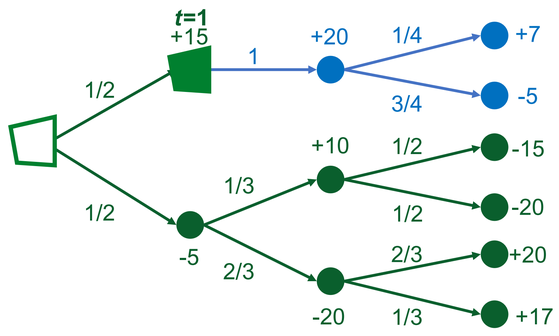
The formation and evolution of reference points in a dynamic setting are rare topics in discussions of reference-dependent preferences.

Based on existing theories about the formation of reference points, we conduct a controlled economic experiment on a representative sample. **Our aim is to establish a unified framework describing reference points in dynamic settings.**

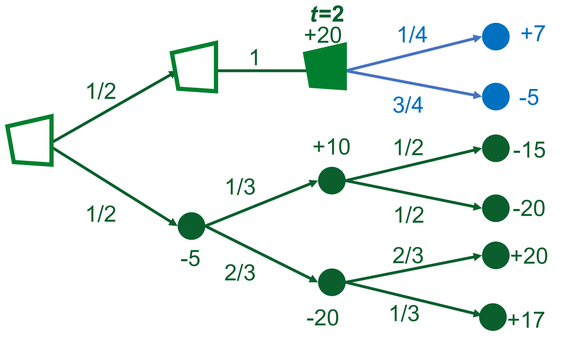
2 Intertemporal Lottery L



t=0
Money in account: 0
Reference point: 0
Evaluate upcoming lottery (in blue)



t=1
Money in account: 15
Reference point?
Evaluate upcoming lottery



t=2
Money in account: 15 + 20 = 35
Reference point?
Evaluate upcoming lottery

How do people formulate reference points? / How do they evolve?

3 Reference Points

Status quo ante

$$R^{SQ} = X_0$$

The starting point of the lottery (usually 0)

Partial adaptation to experienced payoffs

$$R^{A}(t) = \frac{\sum \delta^{t-i} Z_i}{\sum \delta^{t-i}}$$

Weighted average of the experienced **outcomes**
δ = time discounter

Lagged expectations

$$R^{LE}(t) = \frac{\sum \delta^{t-i}\, \mathbb{E}[\mathbf{L}_i]}{\sum \delta^{t-i}}$$

Weighted average of the expectations of experienced **lotteries**

Forward-looking expectations

$$R^{FE}(t) = \mathbb{E}[\mathbf{L}_i]$$

Expectation of the upcoming lottery

Composite Reference Point

$$R = a_1 R^{SQ} + a_2 R^{A} + a_3 R^{LE} + (1 - \sum a_i) R^{FE}$$

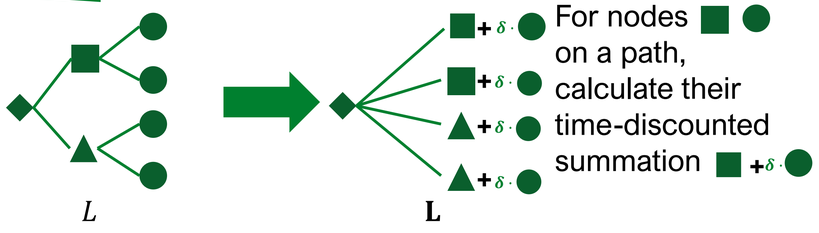
We estimate R given

$$V(CE) = V(\mathbf{L}|R)$$

Using specification of PT (Tversky and Kahneman, 1992)

…in static and dynamic forms

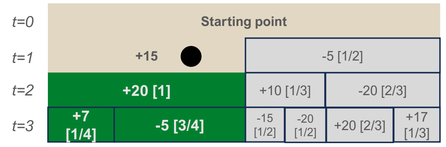
? Reduce L to $\mathbf{L}$



For nodes ■ ● on a path, calculate their time-discounted summation ■ +δ·●

4 Experimental Design

Representation of Lottery: Probability Cascade



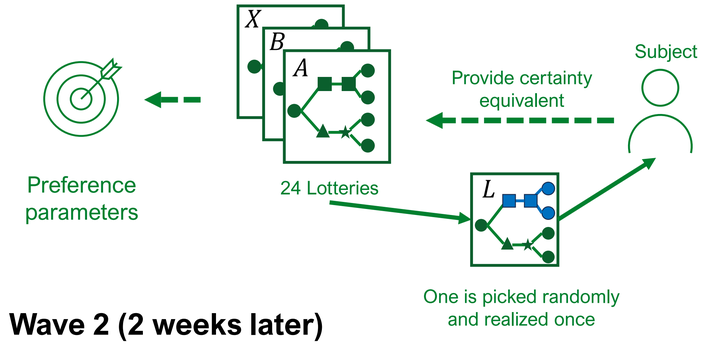
- Box with multiple layers
- Size → probability
- Ball falls to the outcome
- Motion trail → payoff accumulation

Design of Lottery: 24 Mixed Lotteries

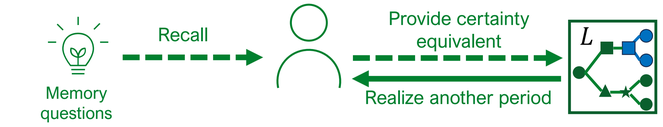
- High/low stake
- Early/late loading
- Four/six outcomes
- 3 periods
- EV = 0

Experiment: Longitudinal Design

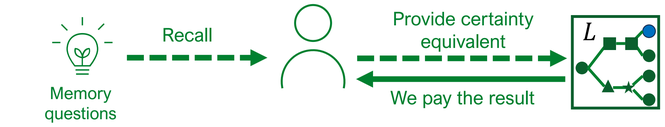
Wave 1



Wave 2 (2 weeks later)



Wave 3 (another 2 weeks)



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