# Wait, Wait... Don't Tell Me: Repeated Choices With Clustered Feedback[1]

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November 23, 2015

[1]This research is supported by the National Science Foundation.

# Motivation

- Most studies of decision under uncertainty provide description of probabilities and payoffs
- Assume that for repeated decisions, people's beliefs represent true state (or beliefs are true on average)
- However, early experience may disproportionally affect choices, leading to insufficient search

# Important decisions rely on experience

- Job seeker discovering what levels of jobs she should target
- Student deciding whether to drop a class based on early quiz outcome
- Customer choosing among suppliers of relatively homogeneous goods
- Even in settings where we have good priors available, experience can affect decisions
  - Cohorts coming of age during a financial crisis may be less likely to invest in stocks

# Feedback

- Decisions are made repeatedly, with subsequent decisions based on previous experience
- An early negative experience may discourage further information collection
- Affects decisions with uncertain outcomes and can lead to seemingly risk averse behavior

- If early feedback disproportionally affects decisions, withholding it may lead to better decisions

**Does the timing of feedback influence risk-taking when decision makers choose based on their experience?**

# Decisions from Experience

- Psychologists developed paradigm to study choices when no information is available a priori
- Decision makers repeatedly choose between two blank buttons and (immediately) observe realizations
- Document substantial deviations from normative behavior and prospect theory: act as if underweighting low probability outcomes

  (Hertwig and Erev, 2009)
- Leads to different choices when information is given vs. when it is "discovered" – the Description-Experience gap

# Myopia (Narrow Bracketing)

- Consider the choice between investing in bonds or stocks
  - Short term: stocks more likely to incur losses
  - Long term: stocks have higher risk-adjusted returns (Mehra and Prescott, 1985)
- Over a lifetime horizon, stocks are a good bet. But may evaluate over much shorter horizons (Read, Loewenstein, and Rabin, 1999)
- Benartzi and Thaler (1995) explain equity premium puzzle with annual evaluation and usual loss aversion parameter

# Benefits of Delayed Information

- Normatively, always want frequent and immediate feedback—but does this hold for a boundedly rational agent?
- Can less frequent feedback also lead to better (ex-post) decisions from experience?
- Feedback provides instrumental value, but immediate feedback may bias decision makers, discourage exploration

# Benefits of Delayed Information

Previous work studies timing of feedback when a description is present.

- Large literature in experimental economics, starting with Gneezy and Potters (1997)
  - Participants allocate an endowment between a safe and a risky asset
  - Observe realization after one period or after three periods
  - Greater investments in risky option with delayed feedback
- Holds with professional traders (Haigh and List, 2005) and is not fixed by markets (Gneezy et al., 2003)

# Feedback Mechanisms

- Gneezy and Potters (1997) and related work look at "aggregate feedback" mechanism.
- Differs substantially from motivating examples, where individual realizations are observed
- We propose a clustered feedback mechanism that does not shroud individual outcomes

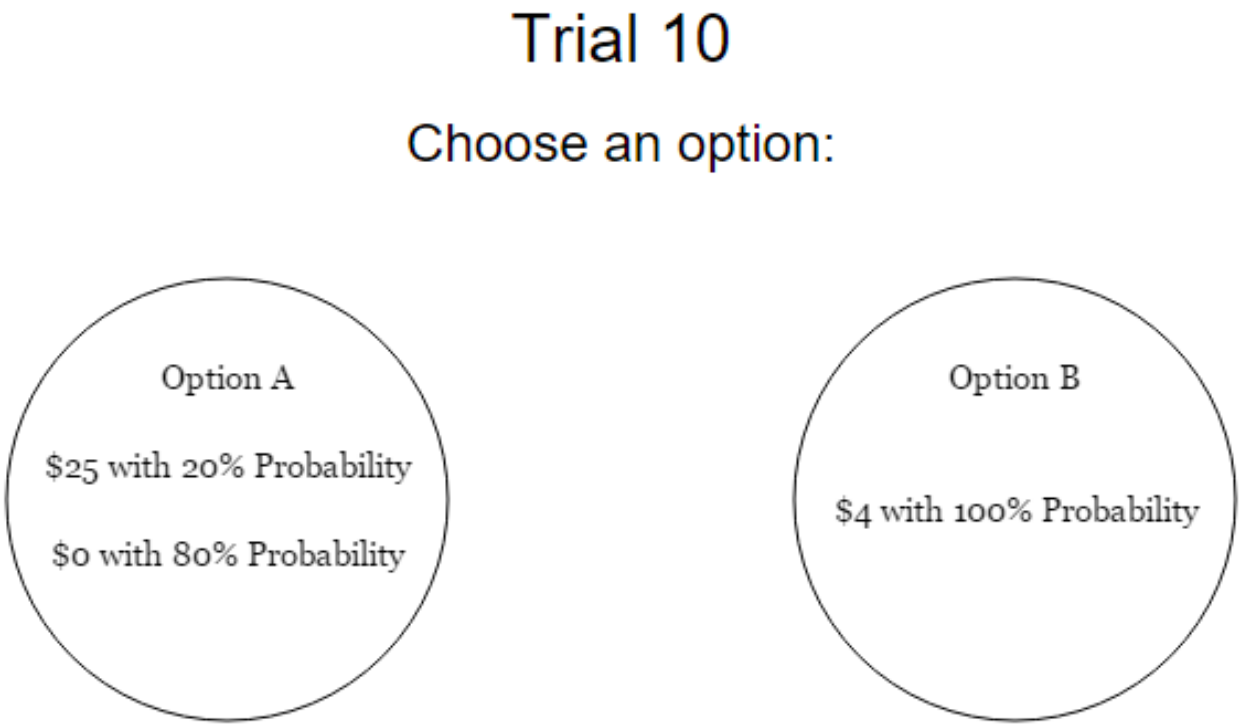
| Period | 1 | 2 | 3 |
|---|---|---|---|
| Immediate Feedback | \$0 | \$5 | \$10 |
| Aggregate Feedback | | | \$15 |
| Clustered Feedback | | | \$0 \$5 \$10 |

# Design Overview

- Decision makers repeatedly make static, binary choice
- Vary three dimensions in a between-subjects design
  1. Presence or absence of description of the options
  2. Immediate feedback vs. clustered feedback
  3. Payoff structure of a risky option (vs. a fixed safe option)

# Experimental Design

- Participants recruited from Amazon Mechanical Turk ($n = 1,216$)
  - 54.4% male, mean age: 32.7
  - Mean earnings \$1.25 (min: \$0.81, max: \$2.01), 7 minutes
- 110 repeated choices in presence or absence of a description (known ex ante)



# Experimental Design

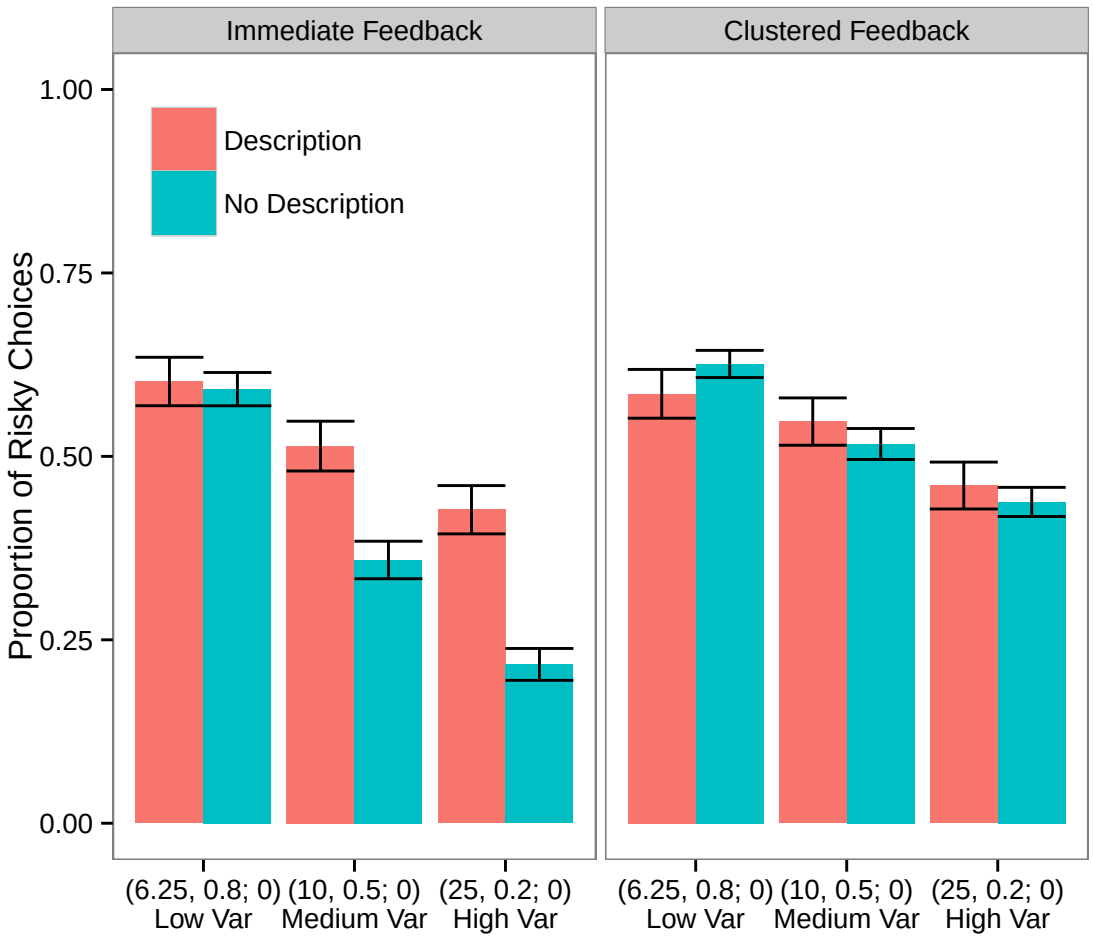
- Participants recruited from Amazon Mechanical Turk ($n = 1,216$)
- 110 repeated choices in presence or absence of a description (known ex ante)
- Receive feedback immediately, or after every 10 trials

| Trial | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Option A | $0 | $0 | $25 | $0 | $25 | - | - | - | - | - |
| Option B | - | - | - | - | - | $4 | $4 | $4 | $4 | $4 |

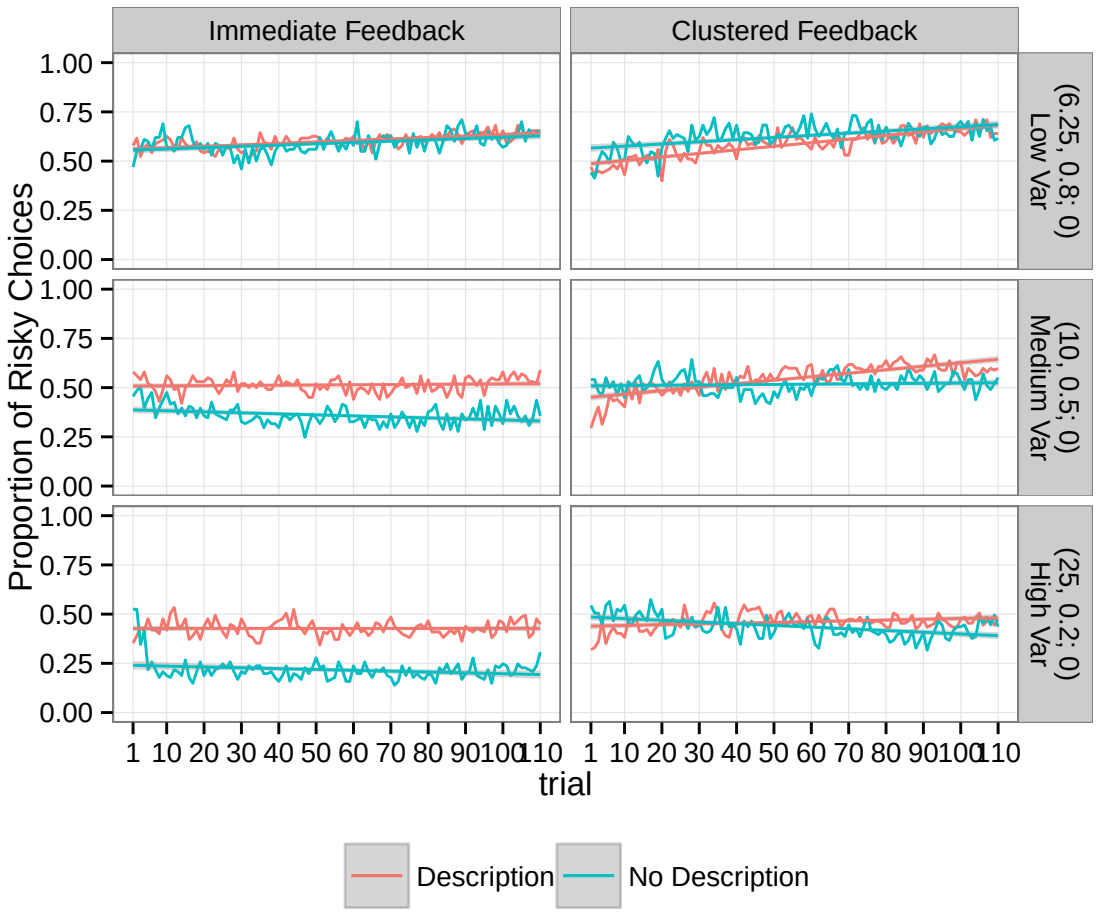
# Experimental Design

- Participants recruited from Amazon Mechanical Turk ($n = 1,216$)
- 110 repeated choices in presence or absence of a description (known ex ante)
- Receive feedback immediately, or after every 10 trials
- Hold fixed the outcome of the safe value (4)
- Vary the structure of the risky option
  - (6.25, 0.8; 0)
  - (10, 0.5; 0)
  - (25, 0.2; 0)
- Payment is sum of all earnings (divided by 400)

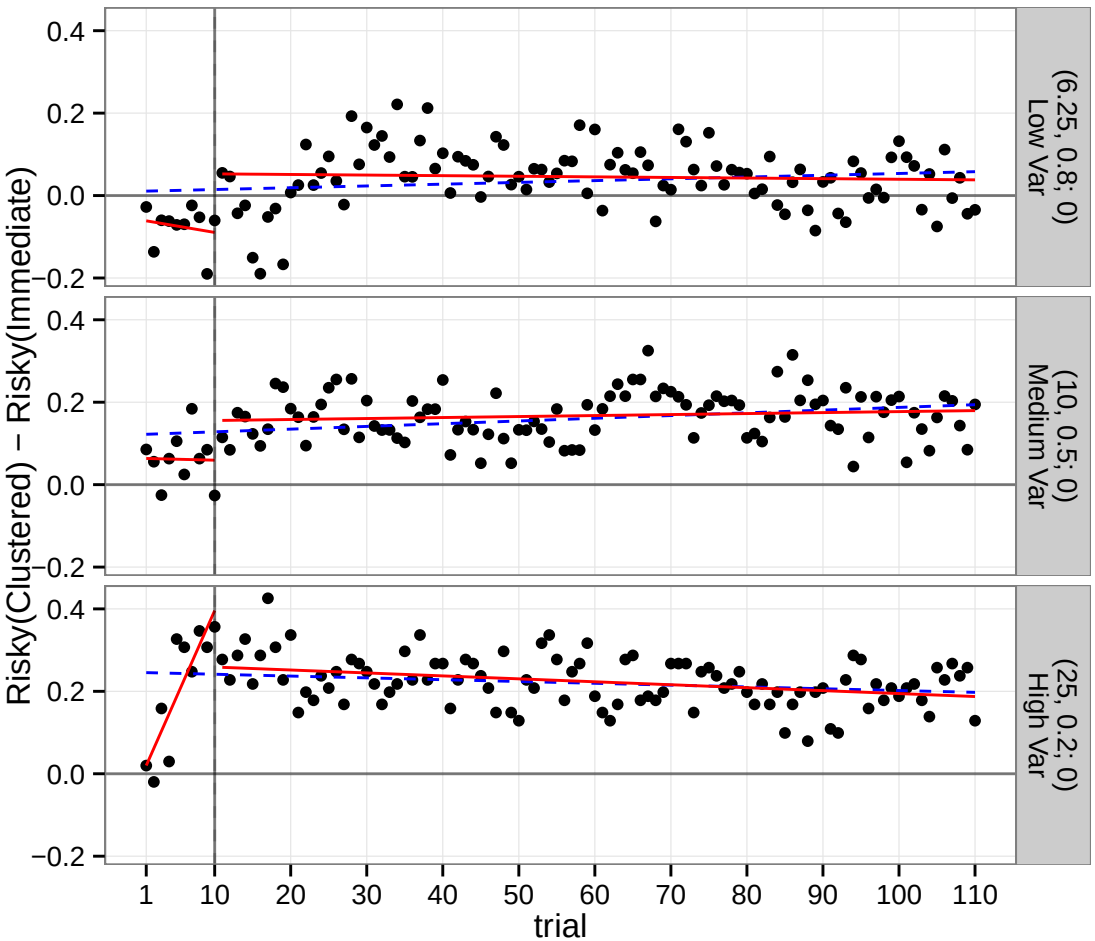
# Results


Immediate Feedback
Clustered Feedback
Description
No Description
Proportion of Risky Choices
1.00
0.75
0.50
0.25
0.00
(6.25, 0.8; 0) Low Var
(10, 0.5; 0) Medium Var
(25, 0.2; 0) High Var
(6.25, 0.8; 0) Low Var
(10, 0.5; 0) Medium Var
(25, 0.2; 0) High Var

# Behavior Over Time



# Difference between Immediate and Clustered Feedback



# Conclusion

- We show that description-experience gap is greater when high payoff is less common than low payoff
- Introduce a novel clustered feedback mechanism and show that it closes description-experience gap – behave as if description were available
- Without description, clustering affects exploration behavior in early periods
- Decisions from experience may differ in other important contexts (e.g. strategic interactions)