Controversial Topics in Gambling: Alberta Gambling Research Institute's 13th Annual Conference

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conference proceedings

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Psycho-biological research stream

13th Annual Conference
Alberta Gambling Research Institute
April 3-5, 2014.
Research in neuroscience and psychology on the mechanisms underlying gambling and related behaviors can offer insights into gambling motivations and may help in the identification and treatment of gambling problems.
The role of memory distortions in gambling

Marcia L. Spetch, University of Alberta

Presented at the 2014 Conference
Alberta Gambling Research Institute
April 3-5, 2014.
Overview of our behavioral studies:

• Described vs experience-based choices
• Context effects - Extreme-outcome rule
• Memory biases and role in risky choice
• Implications and questions
A simple type of gamble:

Choice between two options that have equal overall expected value (i.e. have same payoff over the long run).

- One is certain (Fixed outcome with 100% probability).
- One is a gamble (Two possible outcomes, each with a 50% probability).
Choice between winning options

100% Chance of $20
50% Chance of $40

Choice between losing options

100% Chance of -$20
50% Chance of -$40

People are more risk seeking for losses than for gains. Kahneman & Tversky, 1979.
But, preferences also depend on how the information is provided.

- Described choices: people are told the outcomes and odds.
  e.g. rolling dice, flipping a coin

- Experience-based choices: people learn about outcomes through experience.
  e.g. slot machine, investing in stocks, choosing whether to feed the parking meter, etc.

Are people still more risk seeking for losses than for gains in experience-based choices?
Our experience task: choice between pairs of doors.
Learn about outcomes and odds through feedback
Critical choices are between fixed and risky doors:

**Win trials**
- +20
- +0
- +40

100% 50% 50%

**Loss trials**
- -20
- -0
- -40

100% 50% 50%
Described choices: Gambled more on loss trials

Experience choices: Gamble more on winning trials

*Opposite results in same people, same session

Ludvig & Spetch, 2011
What is going on with experience?

Hypothesis:
People over-weight the extreme outcomes in a decision context (Extreme-outcome rule)

-40  -20  0  +20  +40
Extreme-outcome rule

**Loss Trials**
- 20 (100%)
- 0 (50%)
- 40 (50%)

**Win Trials**
+ 20 (100%)
+ 0 (50%)
+ 40 (50%)
Prediction: Changing the decision context should change risky choice

-40  -20   0    +20    +40

0    +20   +40   +60   +80
Prediction: Changing the decision context should change risky choice

Low Win

High Win

+20
+0
+40

+60
+40
+80

100% 50% 50%

100% 50% 50%
Results: Changing the decision context changed risky choice

Madan, Ludvig & Spetch, in press
Evidence for extreme-outcome memory bias

Followed choice task with memory tests:

1. Are extremes more accessible in memory? 
   *Show risky door, ask to type the first outcome to come to mind.*

2. Is the occurrence of extremes over-estimated? 
   *Show risky door and all outcomes, ask to type the percentage of trials each outcome occurred.*
1. Extremes were more accessible in memory

More people reported the extreme outcomes

2. Occurrence of extremes was also over-estimated

3. Memory biases correlated with risky choices

Madan, Ludvig & Spetch, in press
Altering risky choice through a memory manipulation:

We found that presenting a reminder of the good outcome of a risky choice increase risk seeking.
Conclusions:

• Risk seeking tendencies depend on the source of information about outcomes and odds (described or learned from experience).

• Attractiveness of a gamble option can depend on context.

• Memory biases can influence experience-based risky decisions
Implications:

• The decision context and memory biases may contribute to some cases of gambling.

• These effects may play a larger role in some types of gambling than in others.
  
  • e.g. playing slot machines may be more susceptible to context and memory effects than games where the odds are better known (e.g. roulette).
Questions and current research:

• What constitutes the decision context?
  • e.g. are other people’s wins part of the context? Does the context carry over from one gambling episode to the next?

• What accounts for the large individual differences?
  • Risk-related personality factors, motivation, past experiences?

• At risk populations?
  • Students scoring high on PGSI

• Brain Mechanisms?
  • fMRI
Thanks to funding agencies:

Questions?