Effects of Induced Mood on Attention and Decision Strategies in Risky Choice

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Abstract

The effects of incidental moods (happy vs. sad) on patterns of information search and decision outcomes were investigated in a risky choice task involving mixed-domain gambles. Data were also gathered in a control condition, where participants were instructed to use an EV-calculation strategy. Results using eyetracking data showed significant differences in attention transitions and EV maximization between the EV-instruction and the induced mood conditions, but no differences between the happy and sad mood conditions. Key types of attention transitions were shown to reliably predict the frequency of observed choices consistent with certain optimal and heuristic strategies.

Introduction

Heuristic vs. Analytic Strategy

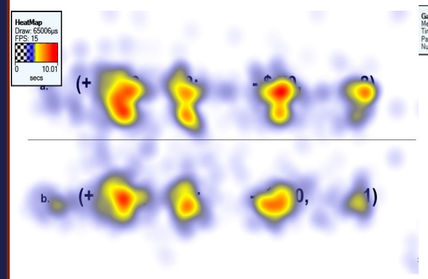
Previous empirical research on affect and decision making has suggested that sad mood leads to more use of analytic decision strategies compared to happiness.

Process Data vs. Outcome Data

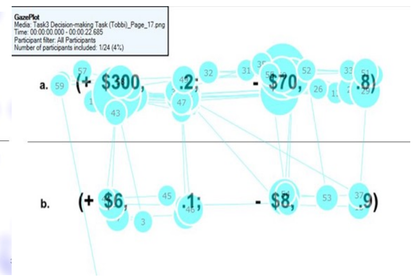
Nevertheless, much of the evidence for this claim has been based on indirect inferences from outcome data (e.g., observed choices, response times). Techniques for gathering and analyzing actual process data have only rarely been used to study the role of affect in decision making.

Goals of the Present Study:

To investigate the influence of incidental moods on decision strategies in a mixed-domain risky-choice task involving both gain and loss information. We used eye-tracking based attentional measures to more directly examine makers' underling decision process. Dependent variables include observed patterns of attention and attention transitions, as well as the propensity to make choices that are consistent with different decision strategies (maximizing expected value, Cumulative Prospect Theory valuations, and Equal Weighting Heuristic).



Tobii eyetracker heatmap sample



Gazeplot sample

Methodology

1. Calibration

- A procedure with the eye-tracker to enable accurate gaze point calculations.

2a. Mood Induction and Self-reported Mood Questionnaire

- Movie clip watching (shown effective in De Vries, Holland & Vitteman, 2008): one categorized as "happy" (from *The Muppet Show*), and the other as "sad" (from *Schindler's List*).

2b. EV Instruction Task

- A separate group of participants was not shown a mood-induction video; they were given instructions on calculating the expected value (EV) of a risky prospect.

3. Mood Manipulation Check. Participants rate on a 7-point Likert scale how well each of the following terms (*happy, joyful, cheerful, enthusiastic, sad, blue, upset, distressed*) described how they feel at that moment.

4. Decision-making Task

- All participants make a choice on 28 risky decision problems. Each of the two presented options was a risky mixed prospect, consisting of a loss and a gain with associated probabilities (see figure below).

a. (+ $300, .2; - $ 70, .8)

b. (+ $100, .9; - $200, .1)

5. Demographics Questionnaire

Results

Mood Manipulation:

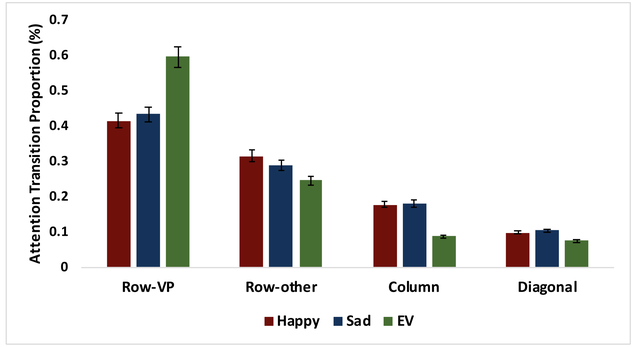
- The mood induction affected both positive mood self-rating scores, $F(1, 41) = 82.78$, $p < 0.001$, and negative mood self-rating scores, $F(1, 41) = 130.47$, $p < 0.001$, in the expected directions. [Univariate ANOVAs]

Patterns of Attention:

- Participants in the EV-instruction condition used a greater proportion of *RowVP* (*within-option transitions between a value $ and its associated probability %),* ($t(54) = 6.33$, $p < .001$), compared to participants in the two induced-mood conditions.
- Participants in the EV-instruction condition showed a lower proportion of *Column (attribute-based comparisons between options)* ($t(54) = 4.14$, $p < 0.001$); *Diagonal (involving a switch of both row and column)* ($t(54) = 3.57$, $p < 0.001$) and *Row-other (within option transitions other than rowVP)* ($t(54) = 3.44$, $p < 0.001$), compared to participants in the two induced-mood conditions.
- The mean proportions of these transition types did not differ significantly between the participants with induced happy mood and those with induced sad mood.

Findings (cont.)

Figure 1. Mean proportions of each attention transition type, by condition.



Decision Choices and Attention Transitions:

- For all participants, the correlations of EV score with 1) the proportion of *Row-VP* transitions was positive and significant; 2) the proportion of *Column* transitions was negative and significant. The results for CPT score followed the same pattern.
- Regarding the heuristic EQW score, no correlations were significant for participants in the EV-instruction condition; but a positive correlation was significant with proportion of *Row_VV* transitions (*within-option transitions between values)* for participants with induced mood.

Discussion

- As expected, participants in the EV-instruction condition showed the clearest evidence for analytic strategy use. They exhibited the most frequent row-VP transitions but the fewest column and diagonal transitions. However, participants with induced happy or sad mood showed near-identical patterns of attention transitions
- Compelling evidence for the validity of using specific types of eyetracking transitions to measure decision process and implicate various decision strategies was provided by the correlations of these specific transition types with computed scores indicating choices consistent with various strategies.
- Forgas (2012) have suggested that the effect of mood on depth of processing is highly context-dependent. It may be that the EV based analytic strategies requiring information integration are the most natural approach for this type of description-based risky decision problem, and thus are relatively resistant to influence by incidental moods.

Reference

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