The effect of emotions on exploration behavior
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Exploitation-exploitation trade-off
Exploration
To exploit resources in order to accumulate gains.
To explore the environment in order to find the information about desired resources.

Content-related influence
People in a negative mood evaluate an object more negatively (i.e., mood congruency effect).
Process-related influence
People in a negative mood process information more carefully and systematically.

Research question and hypothesis

How do emotions impact the decision to explore?

Content-related hypothesis: people in a negative mood are expected to explore more than people in a positive mood.

Process-related hypothesis: people in a negative mood are expected to explore more often in the environments with a low amount of resources, but exploit in the environments with a high amount of resources.

The experimental procedure

1. Demographics measures
2. Control questions test
3. Mood questionnaire (PANAS, 14 items)
4. Fishing task (20 min)
5. Mood questionnaire
6. Self-report of decision-making strategies

Fishing task (Hutchinson et al., 2008)
• A participant forages for fish in a sequence of ponds and decides on how long to stay at each pond.
• A fish pops to the surface at a rate that depends on the number of fish in a pond. The rate decreases as a subject depletes a pond. When a subject decides to switch ponds, he incurs a cost of a constant travel time (Exp. 1: 15 sec., Exp. 2: 7 sec.) between ponds.
• Exp. 1: The number of fish per pond followed a Poisson distribution with the mean = 10.
• Exp. 2: There were three ponds (with zero, ten, and twenty fish) that had an equal probability to appear after switching a pond.

Mood manipulation

Two versions of the Fishing task with music manipulation (Mitterschiffthaler et al., 2007) were used in a between-subject design:
– Positive emotions condition: the task is to fish in the pond.
– Negative emotions condition: the task is to collect dead fish in the polluted pond.

Experiment 1

496 participants (330 female). Mean age = 25.30.

The number of visited ponds

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>6.01</td>
<td>0.51</td>
<td>11.78</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>Negative mood group</td>
<td>1.04</td>
<td>0.51</td>
<td>2.04</td>
<td>&lt; .05</td>
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<tr>
<td>Finishing the task</td>
<td>2.98</td>
<td>0.50</td>
<td>5.96</td>
<td>&lt; .01</td>
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<tr>
<td>Number of fish misses</td>
<td>0.02</td>
<td>0.03</td>
<td>0.66</td>
<td>.51</td>
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</tbody>
</table>

Residence time at each pond

The Likelihood Ratio Test shows that the interaction effect is significantly different from the main effect model, χ²(1) = 5.34, p = .05.

Experiment 2

137 participants (113 female). Mean age = 23.06.

The number of visited ponds

<table>
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<th>Mean</th>
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<th>p</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
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<td>16.61</td>
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<td>0.87</td>
<td>1.15</td>
<td>.14</td>
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<td>0.06</td>
<td>1.66</td>
<td>.12</td>
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</tbody>
</table>

Residence time at each pond

The Likelihood Ratio Test shows that the main effect model is significantly different from the null model, χ²(1) = 4.13, p < .05.

Discussion

The mood might affect the content of thoughts and the way how people process information.

– People in a negative mood have more negative evaluation of a situation and process information more thoroughly.

– People in a positive mood have more positive evaluation of a situation and process information more superficially.

References


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