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The effect of emotions on exploration behavior

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Exploitation-exploration trade-off

Exploitation

To exploit resources in order to accumulate gains.

Exploration

To explore the environment in order to find the information about desired resources.

Impact of emotions

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

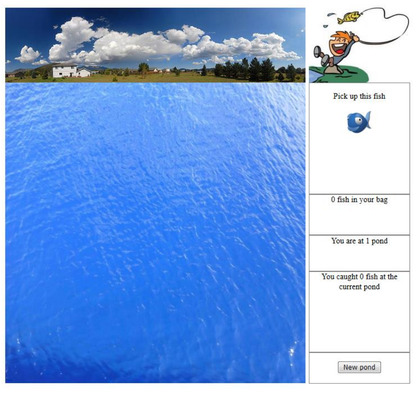
Fishing task (Hutchinson et al., 2008)

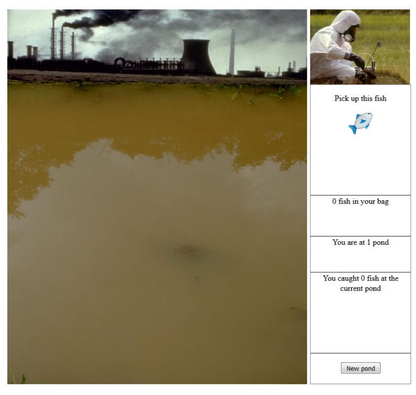
- A participant forages for fish in a sequence of ponds and decides on how long to stay at each pond.
- A fish pops to the surface at a rate that depends on the number of fish in a pond. The rate decreases as a subject depletes a pond. When a subject decides to switch ponds, he incurs a cost of a constant 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

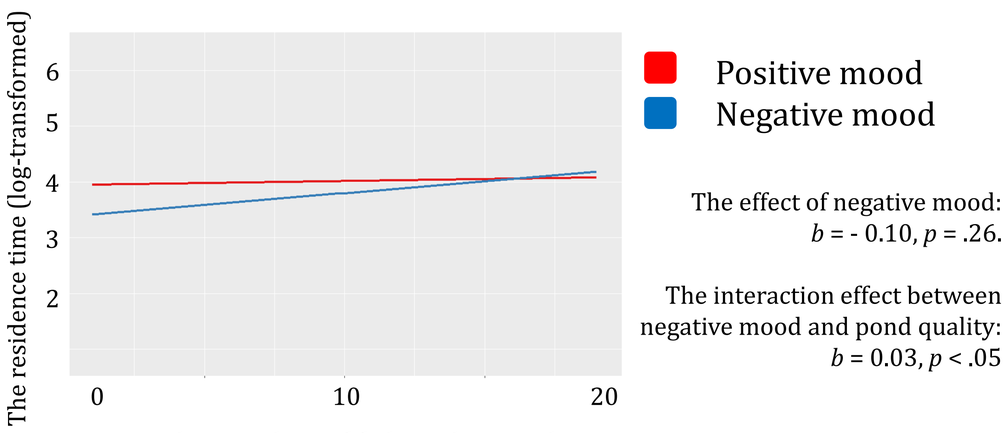
496 participants (330 female). Mean age = 25.30.

The number of visited ponds

	Mean	SE	*t*	*p*
Constant	6.01	0.51	11.78	< .01
Negative mood group	**1.04**	**0.51**	**2.04**	**< .05**
Finishing the task	2.98	0.50	5.96	< .01
Number of fish misses	0.02	0.03	0.66	.51

Multiple regression analysis for the number of visited ponds. Unstandardised regression coefficients are presented.
$N = 496$, $R^2 = 0.08$, $Adj.R^2 = 0.07$, $F\,(3,492) = 14.21$, $p < .01$, $RSE\,(492) = 5.53$.

Residence time at each pond



The effect of negative mood: $b = -0.10$, $p = .26$.

The interaction effect between negative mood and pond quality: $b = 0.03$, $p < .05$

The Likelihood Ratio Test shows that the interaction model is significantly different from the main effect model, $\chi 2(1) = 5.34$, $p < 0.05$.

Experiment 2

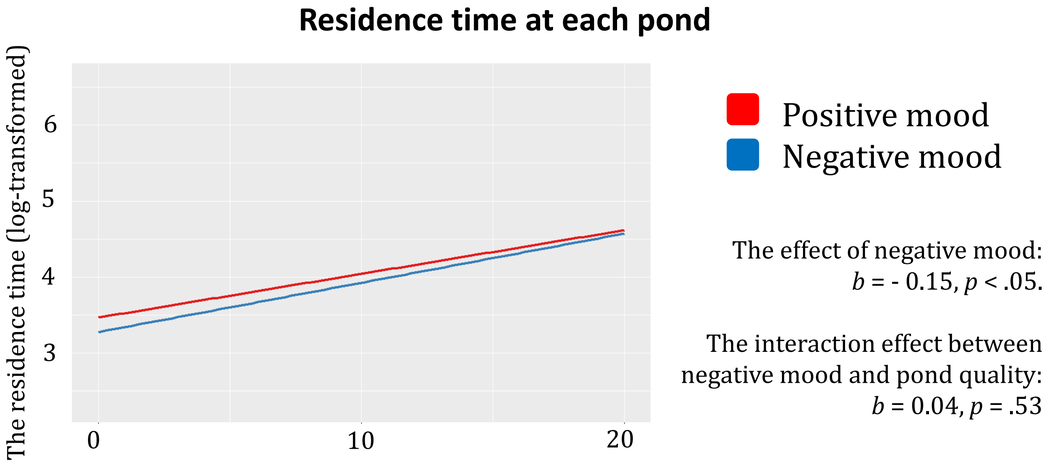
137 participants (113 female). Mean age = 23.06.

The number of visited ponds

	Mean	SE	*t*	*p*
Constant	12.46	0.75	16.61	< .01
Negative mood group	**1.28**	**0.87**	**1.15**	**.14**
Finishing the task	5.17	0.88	5.88	< .01
Number of fish misses	0.10	0.06	1.66	.12

Multiple regression analysis for the number of visited ponds. Unstandardised regression coefficients are presented.
$N = 137$, $R^2 = 0.07$, $Adj.R^2 = 0.07$, $F\,(3,133) = 14.72$, $p < .01$, $RSE\,(133) = 5.01$.

Residence time at each pond



The effect of negative mood: $b = -0.15$, $p < .05$.

The interaction effect between negative mood and pond quality: $b = 0.04$, $p = .53$

The Likelihood Ratio Test shows the main effect model is significantly different from the null model, $\chi 2(1) = 4.13$, $p < 0.05$.

Discussion

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

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

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

References

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