Time and risk perceptions mediate the causal impact of objective delay on delay discounting

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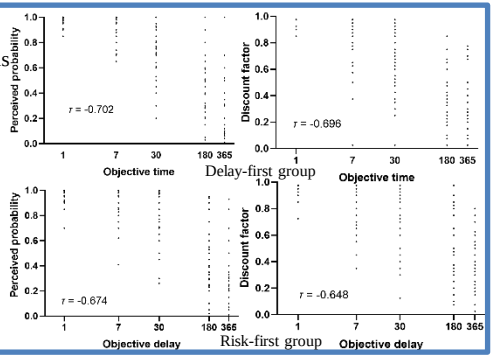
Introduction

- Previous studies have suggested two crucial psychological factors underlying delay discounting, that is, time and risk perceptions. For instance,
  - Patak and Reynolds (2007) argued that people incorporated uncertainty into their valuations for delayed rewards.
  - Zauberman et al. (2009) demonstrated a critical role of time perception in delay discounting.
  - Date/delay effect (e.g., Read, Frederick, Orsel & Rahman, 2005) suggested that time perception was longer when a delay was described in its length (e.g., in 7 days) than when it was described in terms of the due calendar date (e.g., on Aug. 23th).
- The relevant research, however, provided only correlational evidence for a causal chain from objective delay to delay discounting.
- Manipulated experiments were conducted in the current research to establish the causal links among the relevant variables as a support of the implicit-risk hypothesis of delay discounting.

Experiment 1

- Delay lengths were manipulated and corresponding levels of risk perception and delay discounting were measured.
- Forty-one participants took the risk perception task first, whereas other 44 participants took the delay discounting task first.
- Objective delay causally affected risk perception and delay discounting.
- Measuring delay discounting first did not change the subsequent measurement of risk perception.



Experiment 2

- Risk perception was manipulated by asking participants to remind the experimenter of the payment on its due date (i.e. high-risk group, 38 participants) or not (i.e., low-risk group, 36 participants).
- Risk perception and delay discounting were measured by area under the curve (i.e., AUC) and thus lower values indicated higher levels of corresponding measurements.
- The low-risk group showed lower levels of both risk perception and delay discounting than the high-risk group.

	Mean of low-risk group	Mean of high-risk group	BF10	95% credible intervals of effect size
Risk perception	0.563	0.339	21.198	[0.254, 1.338]
Delay discounting	0.658	0.370	180.889	[0.437, 1.576]

Experiment 3

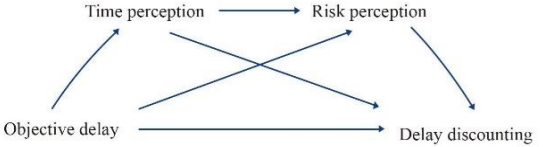
- Time perception was manipulated using the date/delay effect.
- Specifically, 64 participants encountered delays in terms of the due calendar dates (i.e., the short-perception group), and other 68 participants encountered delays in terms of their lengths (i.e., the long-perception group).
- The short-perception group showed a lower level of time perception as well as lower levels of both risk perception and delay discounting than the long-perception group.

	Mean of short-perception group	Mean of long-perception group	BF10	95% credible intervals of effect size
Time perception	0.579	0.733	2394.027	[-1.414, -0.612]
Risk perception	0.573	0.469	3.293	[0.071, 0.838]
Delay discounting	0.565	0.452	3.111	[0.069, 0.813]

- Bayesian path analyses revealed evidence for both the direct effect from objective delay to risk perception and the indirect effect via time perception.

Conclusion

- There is a causal chain from objective delay to delay discounting through risk perception in favor of the implicit-risk hypothesis.
- Time perception causally mediated the influence of objective delay on risk perception.



References

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