A computational exploration of choice variability in interpersonal decision-making

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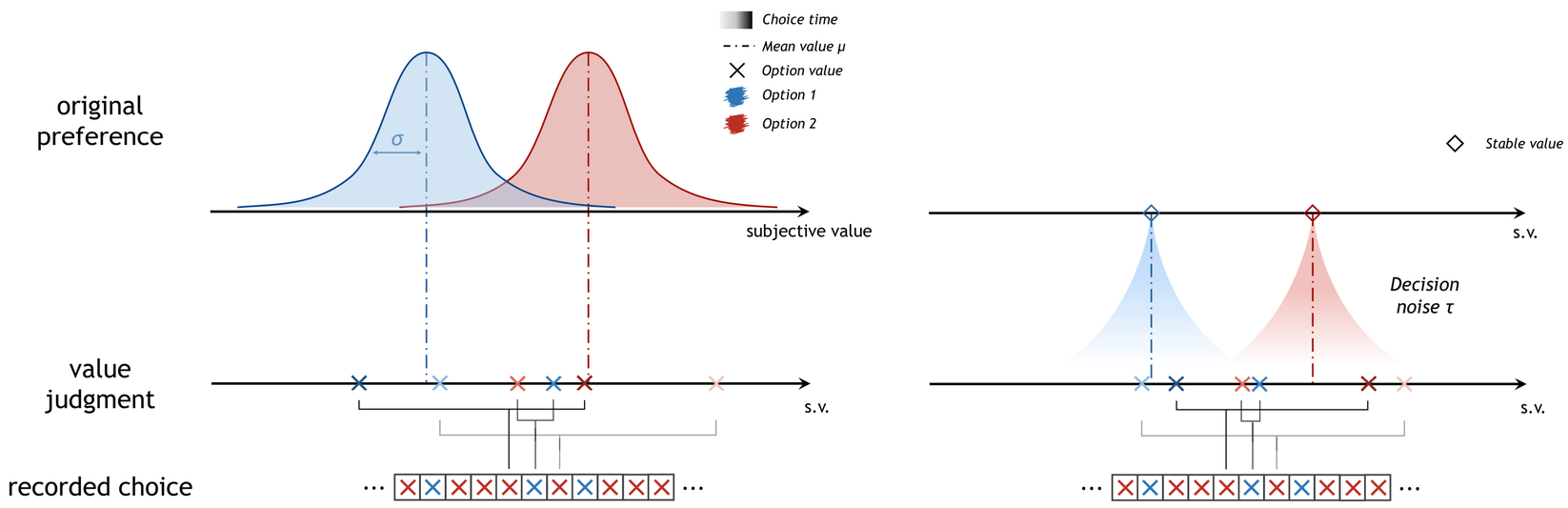
Background. When expressing their preferences, people sometimes make seemingly inconsistent choices. Recently, two models have been proposed to explain this choice variability ①:

the *Preference Uncertainty* model[1] assumes that preferences change continuously, gravitating towards a particular state.

the *Preference Temperature* model assumes that preferences are stable, but that decisions are implemented with noise.

We test these models in an interpersonal decision-making task where participants can reduce their own earnings in order to increase or decrease earnings of an unknown other. ②

① *Preference Uncertainty* / *Preference Temperature*



② Choices in the task ③

Methods. We use an angle α as a proxy of participant's interpersonal preferences[2] ③. We thus assume that each option can be valued as a function of α according to the utility:

$$U(\pi_{you}, \pi_{other}) = \pi_{you} + \tan(\alpha) \cdot \pi_{other}$$

Participants with a positive α are categorised as 'sharing', whereas participants with a negative α are categorised as 'competitive'.

Models are fitted using Hierarchical Bayesian estimation[3] via Markov Chain Monte Carlo estimations.

Results. We estimated the interpersonal preferences of 245 participants, 188 of which were categorized as sharing, and 57 as competitive.

The Preference Uncertainty model accounts for participants' choices better than the Preference Temperature model (ΔDIC = -824.51).

Subsequently, we use the Preference Uncertainty model to predict choice variability based on interpersonal attitude. ④

Linear regression analysis shows a significant effect of attitude type and extremeness of attitude on choice variability ($F(2,242) = 41.17$, $p < .01$, adjusted R^2 = 0.2477).

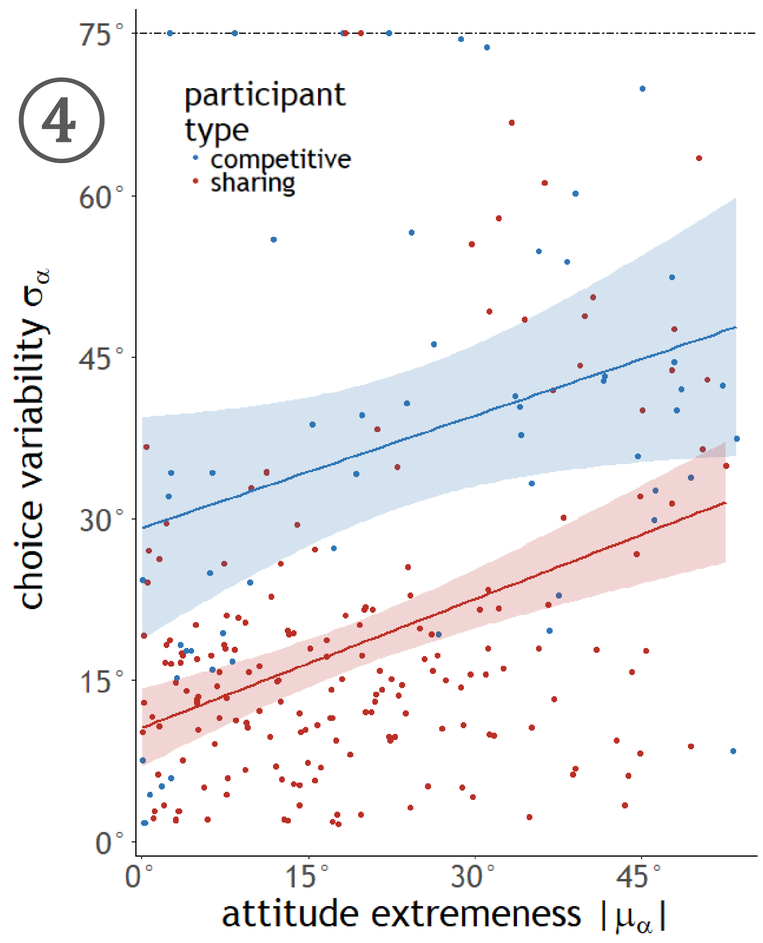
Choice variability is higher in competitive than in sharing participants (t = 6.648, $p < .01$), and the more extreme a participant is, the greater is the choice variability (t = 5.203, $p < .01$).

Conclusions. Preference uncertainty, rather than noisy decisions, seem to better explain interpersonal choices. This is in line with findings on intertemporal decisions,[4] suggesting that the same mechanism is common to different types of preferences.

Sharing participants' low choice variability can be explained by a need to signal their cooperative intentions to others or by a greater concern for adhering to social norms.

High choice variability of extreme participants could be associated with greater uncertainty about their own preferences, and therefore with more volatile behaviour. These findings cast doubts on the stability of any experimental results or real life examples of people showing extreme social attitudes towards others.

④



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