Dopamine and preferences for equal payoffs

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Introduction

Decisions about fairness and equity often involve tradeoffs between maximizing rewards for oneself versus others. While dopamine is linked to reward maximization for oneself, it has also been associated with variation in prosocial personality traits that may influence decisions about equity. We hypothesized that individual differences in dopamine function among humans are related to preferences for fair reward distributions between oneself and others.

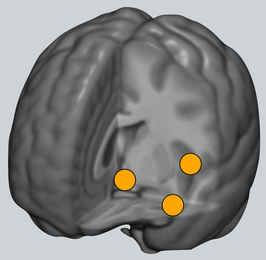
We used PET and dictator game behavior to examine the relation between dopamine and preferences for equal payoffs.

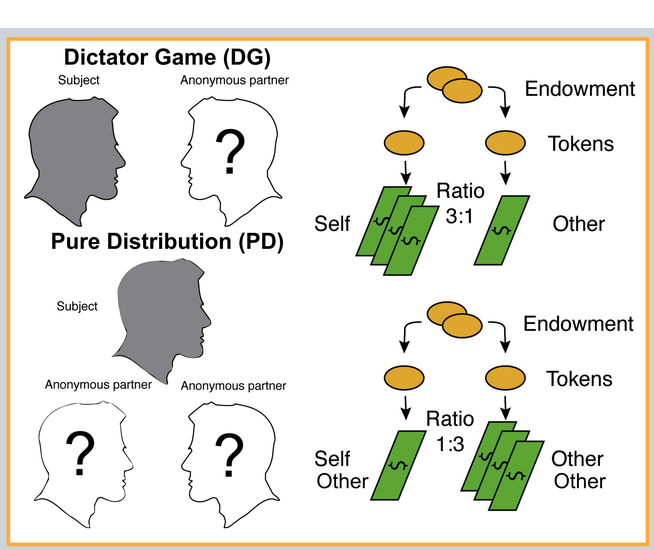
Methods

Economic Games

N = 81 (47 females), ages 22-83 (M = 49.7, SD = 17.7)

20 trials of **DG** (played twice) + 20 rounds of **PD** (played once)





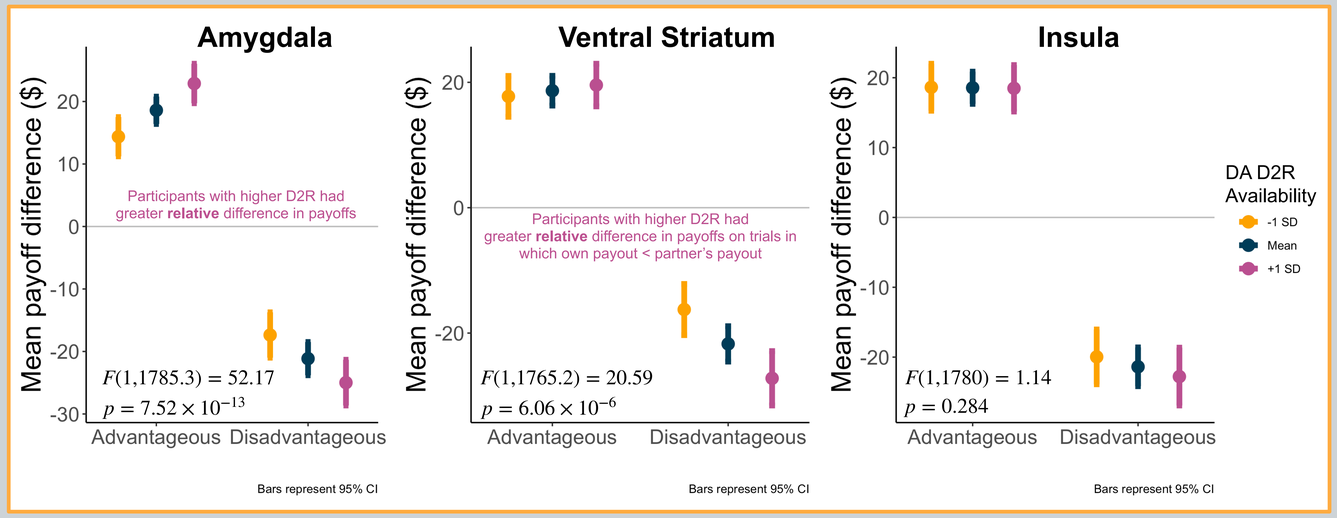
PET Scanning

PET w/[18F]fallypride to label D2Rs. Mean D2R availability was derived for each participant from a priori ROIs in the ventral striatum, midbrain, and amygdala with partial-volume correction.

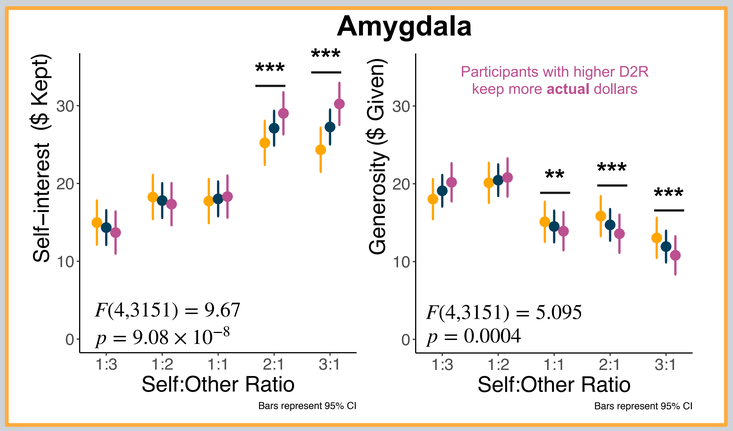
Analysis

Token distribution & D2R data were analyzed using mixed-effects models with random intercepts for participants.

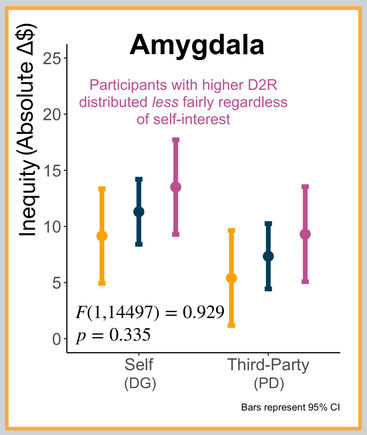
Results



Above: Participants with higher amygdala D2R were generally less fair & participants with higher VS D2R availability were relatively more generous. **Below:** Amygdala-fairness effects depended on the token/dollar ratio.



Right: The same amygdala D2R association with preferences for inequity was observed in participants distributing tokens between third-parties.



Conclusion

The observed effects suggest that individual differences in mesolimbic dopamine shape preferences for equal payoffs. Specifically, higher amygdala D2R availability was associated with greater overall inequity regardless if distributing rewards for oneself. Higher VS D2R was specifically associated with greater disadvantageous inequity.

Individuals with higher amygdala D2Rs preferred LESS equal payoffs. Individuals with higher VS DR2s were MORE generous.

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