



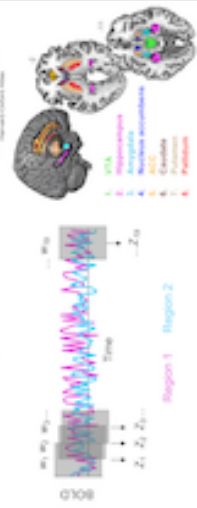
BACKGROUND

- Reward sensitivity largely relies on functioning of the meso-cortico-limbic system
- Prior work has linked subjective reward sensitivity with **traditional** measures of resting striatal connectivity (Angelides, Gupta, and Volkov, 2017)
 - Assumes connectivity is **static** across time
- Mood disorders have been linked with changes in **time-varying** resting connectivity (Kaiser et al., 2016)
- We test links between trait reward sensitivity and variability in meso-cortico-limbic resting connectivity.**

METHODS

- Resting state fMRI scan sample:**
 - 61 adults
 - ages 18-37 (M=23.0, SD=5.0)
 - 45 females
 - ≥ 5 minutes useable resting state data
- Self-Report Surveys:**
 - Reward sensitivity** (Carver and White, 1994)
 - Behavioral Approach System Scale (BAS)**
 - Responsiveness: Consummatory anticipatory reactivity
 - Fun-seeking: Seek for positive rewards
 - Drive: Pursuit of desired goals
 - Depressive symptoms** (Beck Depression Inventory (BDI-II); M=25.0, SD=15.25, Range: 0-58)
 - ROI-to-ROI resting state analysis**
 - Partial Spearman correlations between resting state and BAS scores (controlling for age, sex, BDI, mean fMRI motion)

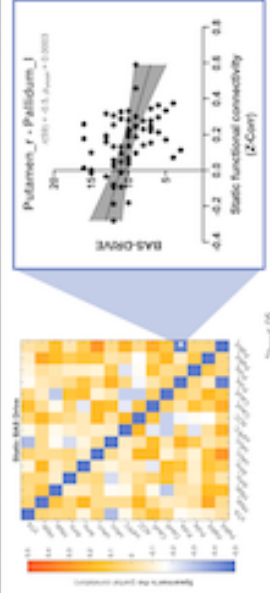
- Static connectivity:** *r*-to-*r* connectivity values (whole time-series)
- Dynamic connectivity:** SD of windowed *r*-to-*r* connectivity values
- Dynamic resting state connectivity analysis:**
 - Sliding-window approach
 - 19 windows (window=55s, step=17.5s)



CENTRAL HYPOTHESIS

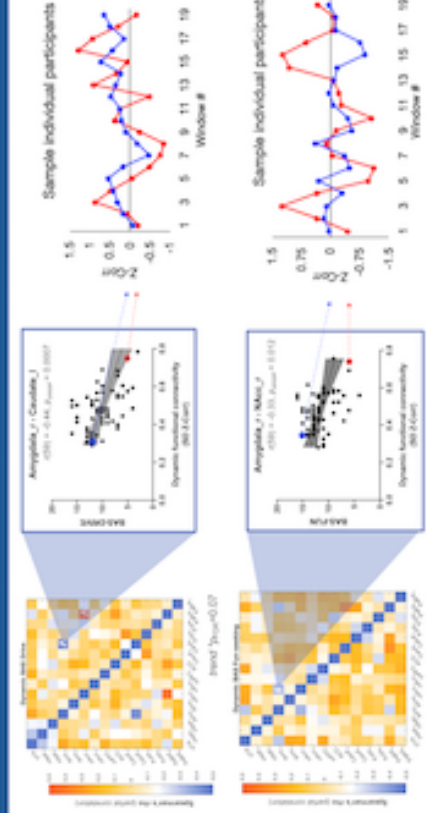
Irregular functional connectivity along the reward pathway is associated with diminished reward sensitivity

STATIC RESTING CONNECTIVITY HEIGHTENED STRIATAL FC AND REDUCED DRIVE



- Link with drive is broadly consistent with basal ganglia contributions to habitual control over motivated and goal-directed actions (Reeve, 2008)
- Low drive might be related to perturbation of the default inhibitory relationship between putamen and globus pallidus (GABAergic)

DYNAMIC RESTING CONNECTIVITY AMYGDALA FC AND REDUCED DRIVE



- Low drive and fun-seeking were linked with more alternations between periods of high and low amygdala connectivity with caudate and nucleus accumbens, respectively.
- High drive was linked with greater dynamic nAcc-pallidum functional connectivity.

TAKE HOME MESSAGES

- Present findings:**
- Time-varying functional connectivity** indices are sensitive to subjective reward-related behaviors
 - Implicate different parts of the reward circuit
 - Striatal resting functional connectivity** are linked to individual differences in **drive**
 - Meso-limbic dynamic functional connectivity** is linked with reduced **fun-seeking**
- Future Directions:**
- Frontal control** (e.g., dorsolateral prefrontal cortex control over striatum)
 - Sub-areas** (e.g., external globus pallidus and basal-lateral amygdala)
 - Spatio-temporal sequencing of brain activity** (Cohen et al., 2016)
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- Preliminary evidence links reward responsiveness with state transition probabilities**

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