Cognition & Decision Seminar Series
presents **Anne Collins** (UC Berkeley)

Intrinsic motivation in reinforcement learning

Abstract: Reinforcement learning frameworks have been successful at explaining how biological or artificial agents learn to make rewarding choices, but the definition of a reward remains ambiguous. In artificial intelligence, the reward function is defined by the goal of the agent, which can be arbitrary. By contrast, neuroscience frameworks mostly consider rewards as goal-independent, objective, extrinsic signals that activate a common brain network, including primary and secondary rewards (such as food and money). However, evidence from psychology shows that humans can experience arbitrary goal-dependent, intrinsic rewards. How does our brain integrate such intrinsic goal-dependent signals to support flexible behavior? Across four different studies, I will characterize the importance of goals as intrinsic learning signals. First, I will show that intrinsic goal signals account for range adaptation effects across five experiments. Second, an fMRI study reveals that executive functions enable us to hijack the brain's reward network to interpret arbitrary goals as reinforcers. Finally, two EEG, behavioral, and modeling experiments explore the mechanisms that support intrinsic motivation in reinforcement learning. These findings suggest that intrinsic motivation plays a crucial role in shaping the learning process and highlight the need to incorporate goal-dependent signals in reinforcement learning models.

Registration: <https://tinyurl.com/2d7uvcuh>
Please note, registration is required in order to allow entry to the building.

Date: **Monday Apr 17, 2023**

Time: **4:00 – 5:30 PM** *(Drinks reception to follow)*

Location: **Columbia Zuckerman Institute**,
3227 Broadway (corner of 130th St)
Jerome L. Greene Science Center,
Room L8-084

Sponsor

The Cognition and Decision Seminar Series is jointly sponsored by the **Cognitive and Behavioral Economics Initiative** of the Department of Economics, and the **Center for Decision Sciences** at Columbia Business School.

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